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To: Steve Morrow
From: Chris Ricardi
Date: December 13, 2010

Subject: Interim Response Steps Work Plan Slurry Wall Monitoring Program 3Q10 – September

2010

DATA VALIDATION REPORT SEPTEMBER 2010 SLURRY WALL SURFACE WATER AND GROUNDWATER OLIN CHEMICAL SUPERFUND SITE WILMINGTON, MASSACHUSETTS TestAmerica Laboratories Data Sets 360-29918-1, 360-29919-1, and 360-30036-1

1.0 INTRODUCTION

Groundwater and surface water samples were collected from the Olin Chemical Superfund Site from August 30 to September 9, 2010. Samples were analyzed by TestAmerica Laboratories in Westfield, Massachusetts. Data were reported in sample delivery groups (SDGs) 360-29918-1, 360-29919-1, and 360-30036-1. A summary of samples included in this review is contained in Table 1. Samples reviewed in this report were analyzed for the following USEPA SW-846 (USEPA, 1996), USEPA wastewater (USEPA, 1993), or Standard Methods (APHA, 1995):

- dissolved metals (aluminum and chromium) by USEPA Method 6010B in groundwater
- dissolved and total metals (aluminum, chromium, and sodium) by USEPA Method 6010B in surface water
- general chemistry analyses for ammonia by USEPA Method 350.1 (Lachat 10-107-06-1), chloride, sulfate, nitrate, and nitrite by USEPA Method 300, nitrite by SM20 SM 4500B, and specific conductance by SM18 SM 2510B

The Draft Interim Response Steps Work Plan (MACTEC, 2007) and the MassDEP Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP) [MassDEP, 2004] were used as references during the review. Analytical packages were reviewed using the Level 1 Data Quality Evaluation checklists that were developed for the Olin Wilmington monitoring tasks. Final sample results are presented on data summaries in Table 2. A summary of validation qualification actions is presented on Table 3 for results that were qualified. Validation reason codes are associated with final results that have been qualified as indicated in Table 3

2.0 METALS

Data were reviewed for the following parameters:

- * Data Completeness
- * Holding Time
 - Blanks
- * Laboratory Control Sample/Laboratory Control Sample Duplicate Analysis
- * Matrix Spike Analysis
- * Field Duplicate Results



- * Detection Limits
 Dissolved vs. Total Metals Comparison
- * = indicates that criteria were met for this parameter

Blanks

In SDG 360-29919-1, chromium was reported in the method blank at 2.48 μ g/L. A similar concentration was reported in associated sample OC-ISCO 3, and the result was qualified as non-detect (U) in the final data.

Dissolved vs. Total Metals Comparison

Dissolved aluminum and dissolved sodium concentrations were over ten percent greater than total sodium concentrations in a subset of surface water samples in SDG 360-29919-1 and 360-30036-1 as presented in the table below. The results for total and dissolved sodium in these samples were qualified estimated J.

					% Dissolved amount is	
				Sodium result	greater than	Final
SDG	fraction	lab_sample_id	field_sample_id	(µg/L)	Total amount	Qualifier
360-29919-1	Dissolved	360-29919-2	OC- ISCO 1	55000	17%	J
360-29919-1	Total	360-29919-2	OC- ISCO 1	47000		J
360-29919-1	Dissolved	360-29919-4	OC- ISCO 3	91000	15%	J
360-29919-1	Total	360-29919-4	OC- ISCO 3	79000		J
360-30036-1	Dissolved	360-30036-1	OC-SD17SW	120000	21%	J
360-30036-1	Total	360-30036-1	OC-SD17SW	99000		J

					% Dissolved amount is	
				Aluminum	greater than	Final
SDG	fraction	lab_sample_id	field_sample_id	result (µg/L)	Total amount	Qualifier
360-29919-1	Dissolved	360-29919-2	OC- ISCO 1	1100	16%	J
360-29919-1	Total	360-29919-2	OC- ISCO 1	950		J

3.0 GENERAL CHEMISTRY – Ammonia, Chloride, Sulfate, Nitrate, Nitrite, and Specific Conductance

Data were reviewed for the following parameters:

- * Data Completeness Holding Time
- * Blanks
 - Matrix Spike Analysis
- * Field Duplicate Analysis
- * Laboratory Duplicate Analysis
- * Laboratory Control Sample/Laboratory Control Sample Duplicate Analysis
- * Detection Limits



* = indicates that criteria were met for this parameter

Holding Time - Nitrate

Sample OC-PZ 17 RR SW was analyzed three hours beyond the 48 hour holding time. The result for nitrate in sample OC-PZ 17 RR SW was qualified estimated (J).

Except for the validation actions noted above, the results are interpreted to be usable as reported by TestAmerica.

Chris Ricards	12/13/2010
Chris Ricardi, NRCC-EAC Senior Chemist	Date
Michael Multphy Project Principal	Date 1/16/11

References:

- American Public Health Association (APHA), 1995. "Standard Methods for Examination of Water and Wastewater"; 19th Edition; APHA, 1015 Fifteenth St., NW. Washington, D.C. 20005.
- MACTEC Engineering and Consulting, Inc. (MACTEC), 2007. "Draft Interim Response Steps Work Plan"; Olin Chemical Superfund Site; 51 Eames Street, Wilmington, Massachusetts; July 25, 2007.
- Massachusetts Department of Environmental Protection (MassDEP), 2004. "The Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; May 2004.
- U.S. Environmental Protection Agency (USEPA), 1993. "Methods for Chemical Analysis and Water and Wastes (MCAWW)", EPA/600/4-79-020 (March 1983) with updates and supplements EPA/600/4-91-010 (June 1991), EPA/600/R-92-129 (August 1992) and EPA/600/R-93-100 (August 1993).
- U.S. Environmental Protection Agency (USEPA), 1996. "Test Methods for Evaluating Solid Waste"; Laboratory Manual Physical/Chemical Methods; Office of Solid Waste and Emergency Response; Washington, DC; SW-846; November 1986; Revision 4 -December 1996.

Table 1 Sample Summary - 360-29918-1, 360-29919-1 & 360-30036

Data Validation Report

September 2010 Slurry Wall / Cap Groundwater and Surface Water Olin Chemical Superfund Site Wilmington, Massachusetts

				SW846 6010B Total	SW846 6010B Filtered	E350.1 (QuickChem 10-107-06-1-B)	SM 2510B	40CFR136A 300.0	A4500 NO2_B
Lab Sample ID	Location	Sample ID	Sample Date						
Slurry Wall / Cap	Groundwater								
360-29918-1	GW-79S	OC-GW 79S	8/30/2010		2	1	1	2	
360-29918-2	GW-202D	OC-GW 202D	8/31/2010		2	1	1	2	
360-29918-3	GW-202S	OC-GW 202S	8/31/2010		2	1	1	2	
360-29918-4	GW-202S	OC-GW 202S DUP	8/31/2010		2	1	1	2	
360-29918-5	OC-PZ-18R	OC-PZ 18R	8/31/2010		2	1	1	2	
360-29918-6	PZ-16RR	OC-PZ 16RR	8/31/2010		2	1	1	2	
360-29918-7	OC-PZ-17RR	OC-PZ 17RR	9/1/2010		2	1	1	2	
360-29918-8	GW-78S	OC-GW 78S	9/1/2010		2	1	1	2	
360-29918-9	GW-25	OC-GW 25	9/1/2010		2	1	1	2	
Slurry Wall / Cap	Surface Water								
360-29919-1	PZ-18R	OC-PZ 18 R SW	9/1/2010	3	3	1	1	3	1
360-29919-2	ISCO1	OC-ISCO 1	9/1/2010	3	3	1	1	3	1
360-29919-3	ISCO2	OC-ISCO 2	9/1/2010	3	3	1	1	3	1
360-29919-4	ISCO3	OC-ISCO 3	9/1/2010	3	3	1	1	3	1
360-29919-5	PZ-16RR	OC-PZ 16 RR SW	9/1/2010	3	3	1	1	3	1
360-29919-6	PZ-17RR	OC-PZ 17 RR SW	9/1/2010	3	3	1	1	3	1
360-30036-1	SD-17	OC-SD17SW	9/9/2010	3	3	1	1	4	

Notes:

Number listed under method indicates number of target analytes reported.

Prepared by / Date: KJC 09/24/10 Checked by / Date: WDC 10/8/10

Table 2 Final Results Summary September 2010 Slurry Wall / Cap Groundwater and Surface Water Olin Chemical Superfund Site Wilmington, Massachusetts

	Loc Name		GW-202D GW-202S		GW-202S		GW-25		GW-	78S	GW-	79S	PZ-16RR				
	Field Sample ID		OC-GW	OC-GW 202D		V 202S	OC-GW 2	02S DUP	OC-GW 25		OC-GW 78S		OC-GW 79S		OC-PZ	. 16RR	
	Field Sample Date		08/31/10 08/31/10		08/31/10		09/0	1/10	09/0	1/10	08/30/10		08/3	1/10			
	QC Code		FS	FS FS		FD FS		S	FS		FS		F	S			
		Lab Sampl	e Delivery Group	360-29	918-1	360-29	360-29918-1 360-299		918-1	360-29918-1		360-29918-1		360-29918-1		360-29918-1	
Frac	Method	Analyte	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
D	SW6010	Aluminum	ug/l	13000		100	U	100	U	100	U	100	U	100	U	100	U
D	SW6010	Chromium	ug/l	1000		5.3		5.7		2.5	J	2.5	J	23		2.1	J
Ν	E300	Chloride	mg/l	230		65		66		100		24		200		250	
N	E300	Sulfate	mg/l	1900		490		490		100		590		830		520	
Ν	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	240		70		62		44		41		120		100	
Ν	A2510B	LAB SPECIFIC CONDUCTA	ANC umhos/cm	4700		1300		1300		720		1300		2700		2300	

Notes:

N = normal

F = filtered

FS = field sample

FD = field duplicate

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micro reciprocal ohms per centimeter

Table 2 Final Results Summary September 2010 Slurry Wall / Cap Groundwater and Surface Water Olin Chemical Superfund Site Wilmington, Massachusetts

			Loc Name	PZ-1	7RR	PZ-1	I8R
			Field Sample ID	OC-PZ	17RR	OC-PZ 18R	
		F	Field Sample Date			08/31/10	
			F	S	FS		
		Lab Samp	le Delivery Group	360-29	918-1	360-29918-1	
Frac	Method	Analyte	Units	Result	Qual	Result	Qual
D	SW6010	Aluminum	ug/l	100	U	100	U
D	SW6010	Chromium	ug/l	4.4	J	12	
N	E300	Chloride	mg/l	20		190	
N	E300	Sulfate	mg/l	510		170	
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	59		52	
N	A2510B	LAB SPECIFIC CONDUCT	ANC umhos/cm	1300		1200	

Prepared by / Date: KJC 10/11/10

Checked by / Date: VDC 10/11/10

Notes:

N = normal

F = filtered

FS = field sample

FD = field duplicate

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micro reciprocal ohms per centimeter

Table 2 Final Results Summary September 2010 Slurry Wall / Cap Groundwater and Surface Water Olin Chemical Superfund Site Wilmington, Massachusetts

			Loc Name	ISCO1	ISCO2	ISCO3	PZ-16RR	PZ-17RR	PZ-18R	SD-17
		F	ield Sample ID	OC-ISCO 1	OC-ISCO 2	OC-ISCO 3	OC-PZ 16 RR SW	OC-PZ 17 RR SW	OC-PZ 18 R SW	OC-SD17SW
		Fiel	d Sample Date	09/01/10	09/01/10	09/01/10	09/01/10	09/01/10	09/01/10	09/09/10
			QC Code	FS	FS	FS	FS	FS	FS	FS
		Lab Sample I	Delivery Group	360-29919-1	360-29919-1	360-29919-1	360-29919-1	360-29919-1	360-29919-1	360-30036-1
Fra	Method	Analyte	Units	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual
Т	SW6010	Aluminum	ug/l	950 J	360	35 J	1100	940	1000	1200
Т	SW6010	Chromium	ug/l	15	65	1.8 U	220	210	18	290
Т	SW6010	Sodium	ug/l	47000 J	140000	79000 J	140000	130000	55000	99000 J
F	SW6010	Aluminum	ug/l	1100 J	56 J	100 U	69 J	170	1100	250
F	SW6010	Chromium	ug/l	10	13	5 U	13	66	12	110
F	SW6010	Sodium	ug/l	55000 J	150000	91000 J	140000	140000	61000	120000 J
N	E300	Chloride	mg/l	60	170	190	250	230	64	170
N	E300	Nitrate as N	mg/l	0.29	3.1	1	5.1	4 J	0.22	1.8
N	E300	Nitrite as N	mg/l							0.1 U
N	A4500_NO2_B	Nitrite as N	mg/l	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
N	E300	Sulfate	mg/l	180	480	22	180	200	200	310
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	19	63	0.7	19	25	21	36
Ν	A2510B	LAB SPECIFIC CONDUCTANCE	umhos/cm	620	1600	720	1200	1200	660	1200

Prepared by / Date:

Checked by / Date:

KJC 10/11/10

WDC 10/11/10

Notes:

N = normal

T = total (unfiltered)

F = filtered

FS = field sample

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micro reciprocal ohms per centimeter

Table 3

Data Validation Action Summary

September 2010 Slurry Wall / Cap Groundwater and Surface Water

Olin Chemical Superfund Site

Wilmington, Massach

Lab Sample											
Delivery					Lab	Lab	Final	Final	Validation Reason		
Group	Lab Sample ID	Analysis Method	Field Sample ID	Parameter	Result	Qualifier	Result	Qualifier	Code	Result Units	Refuse Flag
360-29919-1	360-29919-2	SW6010	OC-ISCO 1	Aluminum	1100		1100	J	TD	ug/l	N
360-29919-1	360-29919-2	SW6010	OC-ISCO 1	Aluminum	950		950	J	TD	ug/l	N
360-29919-1	360-29919-2	SW6010	OC-ISCO 1	Sodium	55000		55000	J	TD	ug/l	N
360-29919-1	360-29919-2	SW6010	OC-ISCO 1	Sodium	47000		47000	J	TD	ug/l	N
360-29919-1	360-29919-4	SW6010	OC-ISCO 3	Chromium	1.8	JB	1.8	U	BL	ug/l	N
360-29919-1	360-29919-4	SW6010	OC-ISCO 3	Sodium	91000		91000	J	TD	ug/l	N
360-29919-1	360-29919-4	SW6010	OC-ISCO 3	Sodium	79000		79000	J	TD	ug/l	N
360-29919-1	360-29919-6	E300	OC-PZ 17 RR SW	Nitrate as N	4	Н	4	J	HT	mg/l	N
360-30036-1	360-30036-1	SW6010	OC-SD17SW	Sodium	99000		99000	J	TD	ug/l	N
360-30036-1	360-30036-1	SW6010	OC-SD17SW	Sodium	120000		120000	J	TD	ug/l	N

Units:

mg/L = milligram per liter

ug/L = microgram per liter

ng/L = nanogram per liter

Validation Qualifier:

U = not detected, value is the detection limit

J = value is estimated

R = rejected

Validation Reason Codes:

BL = QC Blank Qualifier

HT = Holding time exceeded

TD = Dissolved concentration exceeds total

Prepared by / Date: KJC 10/11/10

Checked by / Date: WDC 10/11/10

Version 1.2, Nov 2002

OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

Reviewer/Date /W/While 10/8/10		1
Sr. Review/Date Chris Ricard 11	15	16
Lab Report # 360-19918-1	- 1	
Project # 1.10 2 109016- 13		

Humirum chromium - dissolved	3.0 10.010
.0 <u>Laboratory Deliverable Requirements</u>	
	No [_] N/A [_] Comments: In the identification – Field and Laboratory (IDs must be cross-referenced)
ACTION: If no, contact lab for submission of missing or illegible information.	
1.2 Laboratory Report Certification Statement Yes []	No [_] N/A [_] Comments:
Does the laboratory report include a completed Analytical Report Certification in the required format?	
ACTION: If no, contact lab for submission of missing certification or certification with correct format.	
1.3 Laboratory Case Narrative:	No [_] N/A [_] Comments:
Narrative serves as an exception report for the project and method QA/QC performance.	☐ Narrative includes an explanation of each discrepancy
	Certification Statement.
ACTION: If no, contact lab for submission of missing or illegible information.	
1.4 Chain of Custody (COC) copy present with all documentation completed Yes	No [_] N/A [_] Comments:
NOTE: Olin receives and maintains the original COC.	
ACTION: If no, contact lab for submission of copy of completed COC.	

	1.5 Sample	Receipt Information	(Cooler Receipt For	m present?):	Yes 🔄	No [_]	N/A []	Comments:
,	Were each o		completed and recorded	d upon receipt of the sample(s)				
/				ere sent by courier and delivered ed (where applicable) Field an			100	ture requirement does not apply).
ACTIC	N: If no, cont	act lab for submission	of missing or incomplete	e documentation.				
	1.5.1	Were all samples do	elivered to the laboratory	without breakage?	Yes 🗾	No [_]	N/A [_]	Comments:
	1.5.2	with sample receipt	Receipt Form or Lab Na , condition of the sample ting the quality of the da	rrative indicate other problems s, analytical problems or special ta?	Yes []	No 🗹	N/A [_]	Comments:
		Results Section: Wary report for each same		g requirements supplied in the	Yes 🗾	No [_]	N/A []	Comments:
Z Fie Cle Mat	eld ID and Lab an-up method rix	ID Date a Analysi Target ana	nd time collected is method lytes and concentrations	Analyst Initials Preparation method Un	Dilution Date of p its (soils must	reparation/	extraction/dige	moisture or solids Reporting limination clean-up and analysis, where applicab
ACTI	1.7 QA/QC		each of the following eatch?	te information. g information supplied in the	Yes	No [_]	N/A [_]	Comments:

/							
Met	hod blank	k results	es MS/MSD recoveries and RPDs Laborato	ry duplicate res	ults (where	applicable)	
ACTIO	N: If no	, contact lab for submission	of missing or incomplete information.				
2.0	Holdin	g Times					
Have a		ed? Holding time for metals	ned from date of collection to date of analysis, bee is 180 days from sample collection to analysis for bot		No 🗹	N/A _]	Comments:
NOTE:	List sam	aples that exceed hold time v	rith # of days exceeded on checklist				
ACTIO		_	sceeded, qualify all positive results (J) and non-detecting time) reject (R) all non-detect results.	S			
3.0	Labor	atory Method					
	3.1	Was the correct laborate	ory method used?	Yes 🗾	No [_]	N/A []	Comments:
		Water Digestion Soil Digestion Metals	3005A or 3010A or 3020A 3050B 6010B or 200.7				
comp	pared to		y to provide justification for method chang ontact senior chemist to inform Client of chang		/		
	3.2	Are the practical quant	itation limits the same as those specified by the D Lab MADEP	e Yes	No [_]	N/A []	Comments:
NOT	E: Verify	that the reported metals ma	tch the target list specified on the COC.				
6010.d	ос						

			ct to sample matrix, prep contact lab for explanati					
3	.3 Are results pre	sent for each sample in	the SDG?		Yes 🔼	No [_]	N/A []	Comments:
ACTION:	If no, check Reques	t for Analysis to verify	if method was ordered and	COC to verify that it	was sent, and	d contact lal	o for resubmis	sion of the missin
3	.4 If dilutions we	re required, were dilution	on factors reported?		Yes 🗸	No [_]	N/A []	Comments:
ACTION:	If no, contact the lal	o for submission.						
4.0 <u>N</u>	Method Blanks							
4	.1 Is the Meth	od Blank Summary p	present?		Yes 🔝	No [_]	N/A []	Comments:
ACTIO	ON: If no, call the	laboratory for submis	ssion of missing data.					
4		of Analysis: Was a 1 20 field samples?	nethod blank analyzed for	or each digestion	Yes 🗾	No [_]	N/A []	Comments:
	ON: If no, contact Narrate non-comp		cation. Consult senior c	hemist for action				
4	.3 Is the method	l blank less than the PC	Ls for all target elements?		Voc I	No.I 1	N/A []	Comments:
NOTE: sample		the method blank to	be matrix matched and	digested with the			N/A []	Comments.
	.4 Do any methode following:	d blanks have positive	results for metals? Qualify	y data according to	Yes [_]	No [N/A [_]	Comments:
5010 doc								

If the sample concentration is $< 5 \times$ blank value, flag sample	ple result non-detect "U" at the
PQL or the concentration reported if greater than the PQL	es .

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

ACTION: For any blank with positive results, list all contaminants for each method blank including the concentration detected and the flagging level (flagging level = 5x the blank value) and the associated samples and qualifiers.

5.0 <u>Laboratory Control Standard</u>

5.1	Was a laboratory control standard run with each analytical batch of 20 samples or less?	Yes [No [_]	N/A []	Comments:
ACTION:	target, second source LCS is required by MADEP. Call laboratory for LCS form submittal. If data are not available, use sudgement to evaluate data accuracy associated with that batch.				
5.2	Is a LCS Summary Form present?	Yes [No []	N/A []	Comments:
ACTION: I	no, contact lab for resubmission of missing data.			/	
5.3	Is the recovery of any analyte outside of MADEP control limits? MADEP	Yes []	No 🔝	N/A [_]	Comments:
Sample	Type % Rec				
Water	80-120				
Soil	within Lab generated limits				
ACTION:	If recovery is above the upper limit, qualify all positive sample results				
	tch as (J). If recovery is below the lower limit, qualify all positive and				
non-detects r	esults within the batch as (J). If LCS recovery is <30%, positive and non-				
	are rejected (R).				

Comments:

Yes No NA Comments: MS andyis for duminum and chronce perform on sugle OC-GW 795

Comments:

Yes No No NA Comments:

Yes No No N/A Comments:

Yes [No [] N/A []

6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

Were project-specific MS/MSDs collected? List project samples that were spiked.

ACTION: If no, contact senior chemist to see if any were specified.

6.2 Is the Matrix Spike/Matrix Spike Duplicate Recovery Form present?

NOTE: A full target, second source MS/MSD is required by MADEP.

ACTION: If any matrix spike data are missing, call lab for resubmission.

6.3 Were matrix spikes analyzed as indicated on the COC and project schedule?

ACTION: If any matrix spike data are missing, call lab for resubmission. If none, no qualification is needed. Narrate non-compliance.

6.4 Are any metal spike recoveries outside of the QC limits?

	MADEP	QAPP	
Sample Type	% Rec	% Rec	Method
Water	75-125	N/A	6010B
Water	N/A	(70-130	> 200.7
Soil	75-125	75-125	6010B

NOTE:
$$%R = (SSR-SR) \times 100\%$$

Where: SSR = Spiked sample resultSR = Sample result

SA = Spike added

NOTE: If dilutions are required due to high sample concentrations (> 4X spike), the data are evaluated, but no flags are applied.

NOTE: If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.

ACTION: MS/MSD flags only apply to the sample spiked. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify positive results and non-detects (J).

Are any RPDs for MS/MSD recoveries outside of the QC limits? 6.5

NOTE: $RPD = S-D \times 100\%$

= S-D x 100% Where: S = MS sample result (S+D)/2 D = MSD sample result

NOTE: If dilutions are required due to high sample concentrations, the data are evaluated, but no flags are applied.

ACTION: If the RPD exceeds the control limit, qualify positive results and non-detects (J).

Laboratory Duplicate 7.0

7.1 Was a laboratory duplicate sample analyzed? If so, is the Laboratory Yes [No [] N/A [] Comments: Duplicate Sample Form present?

NOTE: MADEP refers to this sample as a "matrix duplicate".

ACTION: If not analyzed, qualification is not needed. If data is missing, contact laboratory for resubmission of report. Narrate non-compliance.

7.2 Is the RPD between the result for the laboratory duplicate sample and the result for the parent sample outside of the QA/QC limits?

MADEP Laboratory Duplicate Sample RPD Criteria:	QAPP RPD
For aqueous results > $5 \times RL$, RPD must be $\pm 20\%$	20
For aqueous results $< 5 \times RL$, RPD must be $\leq RL$	20
For soil/sediment results > $5 \times$ RL, RPD must be $\pm 35\%$	20
For soil/sediment results $< 5 \times RL$, RPD must be $\leq 2 \times RL$	20

ACTION: If the RPD exceeds the limits, qualify both positive results and non-detects as estimated and flag them J. Narrate non-compliance

8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

- **8.1** Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.
- es No N/A Comments

8.2 Do any rinsate blanks have positive results?

Yes [] No [] N/A [Comments

NOTE: MADEP does not require the collection of rinsate blanks.

ACTION: Evaluate rinsate results against blank results to determine if contaminant may be laboratory-derived. If results are not lab-related, qualify according to below.

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.

oc-Gw 2025 (360-29910-3) and OC-Gw2025 Dep (360-29912-4).

	9.2 Were field duplicates collected per the required frequency?	Yes 🔄	No [] N/A [_] Comments:			
SOV	N □ QAPP (1 per 10) ☑ MADEP Option 1 (1 per 20) □ MADEP Option 3 (1 per 10) □						
	9.3 Was the RPD \leq 50% for soils or waters? Calculate the RPD for all results and attach to this review.	Yes 🗾	No [_] N/A [_	Comments:	Origentes	Dus (my/c)	(Z)
ACTIO	ON: RPD must be ≤50% for soil and water. Qualify data (J) for both sample results	if the RPD e	xceeds 50%.	a luni nem	1000	iou	n/a
10.0	Special QA/QC			chromium	5,3	5.7	7.3
	10.1 Were both total and dissolved metals analysis performed? If so, the dissolved metal concentration should not exceed that of the total metal.	Yes []	No N/A] Comments:			

ACTION: If results for both total and dissolved are $\geq 5x$ the PQL **and** the dissolved concentration is 10% higher than the total, flag both results as estimated (J). If total and dissolved concentrations are less than 5x the PQL **and** the **difference** exceeds 2x the PQL, flag both results as estimated (J)

10.0	Application of Validation Qualifiers		,	
	Was any of the data qualified?	No L	N/A [_]	Comments:
If so, ap	ply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.			
REFE	RENCES			
LAW,	1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Stree Services, Kennesaw, GA 30144. August 1999	t, Wilmin	gton, MA",	LAW Engineering and Environmenta
U.S. E	nvironmental Protection Agency (USEPA), 1989. "Region 1 Laboratory Data Validation Hazardous Site Evaluation Division; February 1989.	Function	al Guideline	es For Evaluating Inorganic Analyses'
MADE	P, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Clear (QA/QC) Requirements." BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.	anup, "Ma	ssachusetts	Quality Assurance and Quality Control
MADE	P, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Clear Sampling, Data Evaluation and Reporting Activities," BWSC-CAM, Section VII, Public Con			

Version 3, October 2008

OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

		10/19
Mns Ricardi	11	151
		1
	29918-1 2016.12	0-29918-1

ammonie, chloride, sulfate, specific conductore

Note: The following analyses will be evaluated according to the "MADEP QA/QC Guidelines for Sampling, Data Evaluation and Reporting Activities." MADEP, however, may not list QA/QC criteria for every chemical analysis. Where not defined by MADEP, criteria will default to values stipulated in the QAPP. Where the QAPP does not define criteria, QA/QC requirements will default to limits employed by the laboratory.

	not define criteria, QA/QC requirements will default to limits employed by the laboratory.					
1.0	Laboratory Deliverable Requirements					
	1.1 Laboratory Information: Was all of the following provided in the laboratory report? Check items received.	Yes 🗾	No [_]	N/A []	Comments:	
	Name of Laboratory Address Project ID Phone #	☑ Sample	e identificatio	n – Field and	Laboratory	
	☐ Name of Laboratory ☐ Address ☐ Project ID ☐ Phone # Client Information: ☐ Name ☐ Address ☐ Client Contact	(IDs must b	e cross-refe	renced)	•	
ACTIO	ON: If no, contact lab for submission of missing or illegible information.					
	1.2 Laboratory Report Certification Statement	Yes [No [_]	N/A [_]	Comments:	
	Does the laboratory report include a completed Analytical Report Certification in the r	required for	nat?			
ACTIO	N: If no, contact lab for submission of missing certification or certification with correct t	format.				
	1.3 Laboratory Case Narrative:	Yes [No [_]	N/A []	Comments:	
	A Narrative serves as an exception report for the project and method QA/QC performance.				ntion of each discrepancy or	n the
		Certi	fication State	ment.		
ACTIO	N: If no, contact lab for submission of missing or illegible information.					
	1.4 Chain of Custody (COC) copy present with all documentation completed?	Yes 🗾	No [_]	N/A []	Comments:	
	Does the laboratory report include copies of Chain of Custody forms containing all samples in	this SDG?				
	NOTE: Olin receives and maintains the original COC.					
ACTIO	N: If no, contact lab for submission of copy of missing completed COC.					
	1.5 Sample Receipt Information (Cooler Receipt Form): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?					

		Yes 🗹	No []	N/A []	Comments:
Sample temperature	confirmed: must be 1° - 10° C. (If samples were sent by courier and delivered o	n the same d	lay as collecti	on, temperatu	re requirement does not apply).
Container type noted	Condition observed pH verified (where applicable) Field and lab II	Os cross refe	renced		
1.5.1 Ammonia,–	to the correct bottles and preservatives used? Under the correct bottles and preservatives used? Liter polyethylene/H ₂ SO ₄ to pH<2,cool to 4°C Liter glass/HCL or H2SO4 to pH<2,cool to 4°C	Yes [No [_]	N/A [_]	Comments:
Alkalinity – Chemical Ox Chloride, pH Nitrate/nitrite Organic Carb	I Liter polyethylene/cool to 4°C tygen Demand – 50 mL polyethylene/H ₂ SO ₄ to pH<2,cool to 4°C tygen Demand – 50 mL polyethylene/cool to 4°C tygen Demand – 50 mL polyethylene/cool to 4°C type - H2SO4 to pH<2,cool to 4°C type - 500 mL amber glass bottle/HCl or H ₂ SO ₄ to pH<2,cool to 4°C type - 500 mL amber glass bottle/HCl or H ₂ SO ₄ to pH<2,cool to 4°C type - 500 mL polyethylene/ZnAcetate + NaOH to pH>9, cool to 4°C				
Phenolics - Honor Specific conditions of ACTION: If no, container/volume (if	I ₂ SO ₄ to pH<2,cool to 4°C ductance, TDS, TSS – 100 mL polyethylene/cool to 4°C inform senior chemist. Document justification for change in applicable), qualify positive and non-detect data (J) data if cooler 10°C. Rejection of data requires professional judgment				
1.5.2	Were all samples delivered to the laboratory without breakage?	Yes 🗾	No [_]	N/A []	Comments:
1.5.3	Does the Cooler Receipt Form or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?	Yes [_]	No 🖸	N/A [_]	Comments:

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		ple Results Section: Was the tor each sample?	e following information supp	olied in the lab	oratory Yes [No []	N/A []	Comments:	
Fiel	d ID and I	ab ID Date and tim	e collected Anal	yst Initials on method	☑ Dilution F ☑ Date of preparation	actor n/extraction	digestion clear	isture or solids Figure and analysis, where appl	Reporting limits
Matr	ix	☑ Target analytes			Units (soils must b	be reported i	n dry weight)		
ACTIO	N: If no,	contact lab for submission of m	issing or incomplete informat	ion.		-			
						7			
		C Information: Was the folloample batch?	owing information provided i	n the laboratory	report Yes	No [_]	N/A []	Comments:	
Meth	nod blank r	esults LCS recoveries	MS/MSD recoveries and	RPDs 🗖 Lab	oratory duplicate resu	ılts (where a	pplicable)		
ACTIO	N: If no, c	ontact lab for submission of m	ssing or incomplete informat	ion.					
2.0	Holding '	Γimes			Yes []	No L	N/A _]	Comments:	
	Have any	technical holding times, deter	mined from date of collection	n to date of ana	llysis, been exceeded	? The hold	ing times are a	s follows:	
	/ 28	lays = ammonia, chemical oxy	gen demand, chloride, organ	ic carbon, oil &	& grease, specific con	nductance, t	otal organic ca	arbon and sulfate	
		alinity = 14 days	Sulfide, TDS, TSS = 7		pH = analyze immed			nitrogen as N = 48 hrs	
	Niti	ite nitrogen as N = 48 hrs	Nitrate + Nitrite as N =	= 28 days		45.0			
	NOTE: I	ist samples that exceed hold tir	ne with # of days exceeded o	n checklist					
		nnical holding times are excee ualify soils.	ded qualify results (J). For v	vater samples ti	hat are grossly excee	eded (>2X h	nold time) reje	ct (R) all non-detect results.	Professional
	3.0 L	aboratory Method			Yes [No [_]	N/A []	Comments:	
	3.1 Was t	he correct laboratory method u	sed?						
ACTIO		ontact lab to provide justification		ed to the reques	ted method Contact	senior chem	ist to inform C	lient of change or to request	variance
WILL	14. II 110, C	mace are to provide justification	ni ioi meulou change compai	ca to the reques	ica memoa. Contact	semoi enem	ist to illionill C	nem of change of to request	variatioe.

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	3.2 Are the practical quantitation li ☐ QAPP/IRSWP ☐ Lab?	mits the same as those specia	fied by the Yes [_]	No [_] N/A [_]	Comments:	+
	Note: The MADEP QA/QC Guidelines do therefore all criteria will default to values stip define criteria, QA/QC requirements defaumay also apply.	oulated in the QAPP*. Where the QAPP	APP does not		Spe coul lub report lind is I unhas kem.	,
	Ammonia* ≠ = 0.1 mg/ L	Alkalinity** $\square = 1 \text{ mg/L}$	Bicarbonate A	lkalinity** □ = 1 mg/L	Carbonate Alkalinity** □ = 1 mg/L	,
	Nitrate Nitrogen as $N* \square = .05 \text{ mg/L}$	Nitrite Nitrogen as N* □ = .01 mg	g/L Chloride*	1 mg/L	Hardness *□ = 2 mg/L	
	Spec. Cond.** 2 3 umhos/cm	Total Organic Carbon** □ = 1 m	ng/L Oil & Grease	* □ = 5.5 mg/L	Sulfate (EPA 300.0)*	L
	COD:* Low – 20 mg/L	COD* High - 50 mg/L □	TDS* □ = 10	mg/L	TSS* \square = 5 mg/L	
	pH* □ < 2 to > 12	Phenolic - 0.01 mg/L				
	Other parameter(list)	_PQL =	☐ Source of PQL =			
	Other parameter(list)	PQL =	☐ Source of PQL =			
ACTIO	N: If no, evaluate change with respect to san	nple matrix, preparation, dilution, m	noisture, etc. If sample PQ	L is indeterminate, contact	lab for explanation.	
	3.3 Are the appropriate parameter results pr	esent for each sample in the SDG?	Yes 🔄	No [_] N/A [_]	Comments:	
ACTIO	N: If no, check Request for Analysis to verify	y if method was ordered and COC to	o verify that it was sent, ar	nd contact lab for resubmis	sion of the missing data	
	3.4 If dilutions were required, were dilution is	factors reported?	Yes 🔟	No [] N/A []	Comments:	
			-			
ACTIO	N: If no, contact the lab for submission.					
1.0	Method Blanks		Yes [No[] N/A[]	Comments:	
	Method Blanks		16 [2]	NO LI NA LI	Confinents.	
	4.1 Are the Method Blank Summaries prese	ent?				
ACTIO	N: If no, call the laboratory for submission of				5	
	4.2 Was a method blank analyzed for each	NO. (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	d samples of	/		
	20 or less?	mangon outen or not entered y ner	Yes [_	No [_] N/A [_]	Comments:	

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ACTIO	N: If no,	document discrepancy in case narrative and contact lab for justification. Consult seni	or chemist fo	or action need	ded.	
	4.3 Is th	e method blank less than the PQL? (See Section 3.2 for PQLs).	Yes 🗾	No [_]	N/A []	Comments:
		any method blanks have positive results for wet chemistry parameters? Qualify data ng to the following:	Yes []	No 🗹	N/A []	Comments:
		mple concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the the concentration reported if greater than the PQL.				
	If the sa	mple concentration is $> 5 \times$ blank value, no qualification is needed.				
ACTIO qualifie		y blank has positive results, list all the concentrations detected and flagging level (fla	gging level	= 5 × blank v	value) on the c	hecklist. List all affected samples and their
5.0	Labora	tory Control Standards				
	5.1	Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less?	Yes 📈	No [_]	N/A []	Comments:
		, call laboratory for LCS form submittal. If data is not available, use professional mine qualification actions for data associated with the batch.		,		
	5.2	Is a LCS Summary Form present?	Yes 🔟	No [_]	N/A []	Comments:
ACTIO	N: If no,	contact lab for resubmission of missing data.				
	5.3	Is any wet chemistry analyte LCS recovery outside the control limits?	Yes []	No [_]	N/A []	Comments:

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OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST

			WET CHEMISTRY PARAMET	ERS BY VARIOUS	метно	DS			
	LCS	Limits:							
	Total C	nity** □ = 80-120% Organic Carbon** □ = 80-120% Low* □ = 80-120% ess* □ = 80-120%	Bicarbonate Alkalinity** □ = 80-120% TDS** □ = 80-120% COD High* □ = 80-120% Chloride* □ = 80-120%	Carbonate Alkalir Oil & Grease* Nitrate Nitroge Sulfate (EPA 300	n as N**E	6] = 80-120%		rogen as N* gen as N**	= 80-120% = 80-120% = 80-120% TSS* NA
	Other p	parameter(list)	%R =		□ Rec	Limits=			
	Other p	parameter(list)	%R =		□ Rec	Limits =			
			(MADEP has not yet defined LCS recov	ery limits for wet c	hemistry a	nalyses.)			
within t	he batch Matrix	as (J). If LCS recovery is <10%, Spikes	qualify all positive sample results within the non-detect results are rejected (R).		overy is bel	ow the lower li	mit, qualify all p	ositive and	no-detect results
specifi			ents for each set with the senior chemist.						
ACTIC		Were project-specific MS/MSDs , contact senior chemist to see if a	s analyzed? List project samples that were spans were specified	piked.	No[]	N/A []	Comments:	Ammons	of MS/MSI) of on C-PZ 17RR 9918-75.
10110	6.2	Is the MS/MSD Recovery Form					S	ande o	C-PZ 17RR
ACTIC	N: If no	o, contact lab for resubmission of		Yes 🗹	No [_]	N/A []	Comments:	(360-2	9918-71.
	6.3	Were matrix spikes analyzed matrix?	at the required frequency of 1 per 20 same	ples per Yes	No [_]	N/A []	Comments:		
ACTIO	N: If an	y matrix spike data is missing, ca	ll lab for resubmission.		,				
	6.4	Are any wet chemistry analyte	spike recoveries outside of the QC limits?	Yes [🖍	No [_]	N/A [_]	Comments:	1-29	4-108)
				Av	n moni	a MY/	ist to K	1 1	1 1.1.

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cers then lower limit. Unspited sample result greater than four times spike

NOTE: %R (SSR-SR) 100% Where: SSR Spiked sample result SA SR = Sample result SA = Spike added MS/MSD Recovery Limits: Ammonia* (LACHAT) = 75-125% Alkalinity* = NA Bicarbonate Alkalinity* = NA Carbonate alkalinity* = NA Chloride*(SM 4500 Cl) □= 75-125% Specific Conductivity * = NA Total Organic Carbon* = NA TDS** = NACOD High* □ = 75-125% Oil & Grease* = NA COD Low* □ = 75-125% Nitrate Nitrogen as $N^{**} \square = 75-125\%$ Nitrite Nitrogen as $N^{**} \square = 75-125\%$ Hardness* □ = 75-125% Sulfate (EPA 300.0)* $\Box = 75-125\%$ pH* = NA TSS* = NA% R = □ Rec Limits = Other parameter(list)

** = Olin QAPP Limits (MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)

NOTES: 1) If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.

2) If the MS/MSD was performed by the laboratory on a non-project sample, no qualification is required.

ACTION: MS/MSD flags only apply to the sample spiked. Do not evaluate if sample concentration is > 4X spike. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit but > 30%, qualify both positive results and non-detects (J). If the MS/MSD recovery is < 30% and the sample is non-detect, the results are considered unusable and flagged (R).

ACTION: Laboratory control limits apply when spiked sample results fall within the normal calibration range. If dilutions are required due to high sample concentrations, the data is evaluated, but no flags are applied.

6.5 Are any RPDs for MS/MSD recoveries outside of the QA/QC limits?

NOTE: RPD = S - D x 100% Where S = MS result D = MSD result

Yes No NA Comments:

MS/MSD RPD Limits:

* = Laboratory Limits

RPD ≤20

Laboratory Duplicate

Are the RPDs for the laboratory duplicates <20% unless otherwise specified below?

Yes [_] No [_] N/A [_] Comments

7.0

ACTIO	ON: If the RPD is greater	r than specified limits, qualify all results for	or that analyte as estimated (J).				
	pH* □ = 3%	Specific Conductivity $*\Box = 5\%$	TSS** □ = 6%			TDS** □ = 6%	6	
8.0	Sampling Accuracy							
		er samples are collected directly from e blanks will not be collected.	a tap, process stream, or					
	8.1 Were rinsate bland associated samples from	ks collected? Prior to evaluating rinsate in the senior chemist.	blanks, obtain a list of the			N/A [_]		
	8.2 Do any rinsate blan	ks have positive results?		Yes [_]	No [_]	N/A	Comments:	
ACTI		esults vs. blank results to determine if ation is < 5 × blank value, flag sample results						the table below.
	If the sample concentr	ation is > 5 × blank value, no qualification	is needed.					
NOTE	MADEP does not req	quire the collection of rinsate blanks.						
9.0	Field Duplicates				_			
	 Were field dupl field duplicates. 	icate samples collected? Obtain a list of s	amples and their associated	Yes 🔼	No [_]	N/A []	Comments: Field	d duplicate 10 360-29918-3) 560 2023 OUP 360-2998-4)
	9.2 Were field duplica	ites collected per the required frequency?		Yes 🔝	No [_]	N/A []	and oc - 6	w zers oup
QA	PP/IRSWP □ MADE	EP Option 1(1 per 20) MADEP 0	Option 3 (1 per 10) 🗆				(360-2998-4)
	9.3 Was the RPD ≤ 30 attach to this review	% for waters≤ 50% for soils? Calculate	the RPD for results and	Yes 🔟	No 🔲	N/A []	The state of the s	1
				Analyt		0116	DOP	RPO
					condulma		()000	0
				am mo		70	62	12
WET	HFM doc		Page 8 of 9	2.000 /		45	66	1.5

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ACTION:. Qualify data (J) for both sample results if the RPD exceeded.				
Was any of the data qualified?	Yes []	No N/A	Comments:	
If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.				
REFERENCES:-				
REFERENCES:-				
MACTEC, 2007. "Draft Interim Response Steps Work Plan"; Olin Chemical Superfund Site, 51 E 25, 2007.	ames Stree	t, Wilmington, Massachuse	etts.; Project No.	6300-06-0010/41.1; July
Massachusetts Department of Environmental Protection (MADEP), 2004. "The Compendium of Que for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Conti Massachusetts 02108; WSC-CAM; May 2004.	uality Assu ingency Pla	rance and Quality Control in (MCP)"; Bureau of Was	Requirements and ste Site Cleanup;	d Performance Standards 1 Winter Street, Boston,

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Version 1.2, Nov 2002

OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

Reviewer/Date	Me Ulu plake	
Sr. Review/Date		10
Lab Report #	360-199/9-1	
Project # 610	2100016,12	

ICF METALS BY METHOD 0010B/200./	Project # 218 + 1000/6,72
total /dissolved - alminum, chronium, sodium	
1.0 <u>Laboratory Deliverable Requirements</u>	
1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes Check items received.	No [] N/A [] Comments:
	ole identification – Field and Laboratory (IDs must be cross-referenced)
	IDS must be cross-referenced)
ACTION: If no, contact lab for submission of missing or illegible information.	
1.2 Laboratory Report Certification Statement Yes []	No [_] N/A [_] Comments:
Does the laboratory report include a completed Analytical Report Certification in the required format?	
ACTION: If no, contact lab for submission of missing certification or certification with correct format.	
1.3 Laboratory Case Narrative: Yes [_]	No [_] N/A [_] Comments:
Narrative serves as an exception report for the project and method QA/QC performance. on the	☐ Narrative includes an explanation of each discrepancy
	Certification Statement.
ACTION: If no, contact lab for submission of missing or illegible information.	
1.4 Chain of Custody (COC) copy present with all documentation completed Yes	No N/A Comments:
NOTE: Olin receives and maintains the original COC.	
ACTION: If no, contact lab for submission of copy of completed COC.	

	1.5 S	ample Re	eceipt Information (Cooler Receipt	Form present?):	Yes 🔼	No []	N/A [_]	Comments:
		each of t e laborate	he following tasks completed and recory?	corded upon receipt of the sample(s)				
/			/	oles were sent by courier and delivered overified (where applicable)				ture requirement does not apply).
ACTIO	N: If n	o, contac	t lab for submission of missing or inco	mplete documentation.				
	1	1.5.1	Were all samples delivered to the labor	ratory without breakage?	Yes 🔟	No [_]	N/A [_]	Comments:
	İ	,	Does the Cooler Receipt Form or La with sample receipt, condition of the sa circumstances affecting the quality of t	imples, analytical problems or special	Yes [_]	No [N/A 📋	Comments:
	1.6 S	ample F	Results Section: Was each of the for report for each sample?	lowing requirements supplied in the	Yes 📋	No [_]	N/A [_]	Comments:
	п-ир т	nd Lab II ethod	Date and time collected Analysis method Target analytes and concentra	☑ Preparation method /	Dilution F Date of pits (soils must	eparation/e		moisture or solids Reporting limitestion clean-up and analysis, where applicable)
ACTIO	N: If r	o, contac	t lab for submission of missing or inco	mplete information.				
	1.7 Q labora	A/QC I	nformation: Was each of the following the fo	owing information supplied in the	Yes 🗾	No [_]	N/A [_]	Comments:

Method blank resu	ults LCS recoveries	MS/MSD recoveries and RPDs	Laboratory duplic	cate results (where	applicable)	
ACTION: If no, con	tact lab for submission of	missing or incomplete information.				
2.0 Holding Ti	mes					
	Holding time for metals i	d from date of collection to date of s 180 days from sample collection to an		□ No □	N/A _]	Comments:
NOTE: List samples	that exceed hold time wit	h # of days exceeded on checklist				
		eeded, qualify all positive results (J) a g time) reject (R) all non-detect results.				
3.0 <u>Laborator</u>	v Method					
3.1 Wa	as the correct laborator	y method used?	Yes	No □	N/A [_]	Comments:
Soi	il Digestion	3005A or 3010A or 3020A 3050B 6010B or 200.7				
	requested method. Co	to provide justification for me ntact senior chemist to inform Clie				
3.2 Are	e the practical quantita	tion limits the same as those spe	ecified by the Yes	✓ No □	N/A []	Comments:
NOTE: Verify that	the reported metals mate	h the target list specified on the COC.				
(010.1-						
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	If no, evaluate variation with respect to sample matrix, preparation, dilution etc. If sample PQL is indeterminate, contact lab for explanation.	n,				
3.3	Are results present for each sample in the SDG?	Yes 💹	No [_]	N/A [_]	Comments:	
ACTION: If	no, check Request for Analysis to verify if method was ordered and COC to verify that	at it was sent, and	d contact la	b for resubmi	ssion of the missing	g data
3.4	If dilutions were required, were dilution factors reported?	Yes 🗾	No [_]	N/A []	Comments:	
ACTION: If	no, contact the lab for submission.					
4.0 <u>Met</u>	hod Blanks					
4.1	Is the Method Blank Summary present?	Yes 🔟	No [_]	N/A [_]	Comments:	
ACTION:	If no, call the laboratory for submission of missing data.					
4.2	Frequency of Analysis: Was a method blank analyzed for each digestio batch of < 20 field samples?	n Yes	No [_]	N/A []	Comments:	
	If no, contact laboratory for justification. Consult senior chemist for actionarrate non-compliance.	n				
4.3	Is the method blank less than the PQLs for all target elements?	Von I 1	Noted	N/A F I	Commenter	
NOTE: Mi samples	ADEP requires the method blank to be matrix matched and digested with th		3555555		Comments:	
4.4 the fo	Do any method blanks have positive results for metals? Qualify data according tollowing:	to Yes	No []	N/A [_]	Comments: C of last blant in caple (home
		was nego	rtd is	nthe m	Alor blant	· AL
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If the sample concentration is < 5 × blank value, flag sample result non-detect "U" a	at the
PQL or the concentration reported if greater than the PQL.	

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

ACTION: For any blank with positive results, list all contaminants for each method blank including the concentration detected and the flagging level (flagging level = 5x the blank value) and the associated samples and qualifiers.

5.0	Laboratory	Control	Standard
2.0	Laboratory	Control	Stanuaru

5.1	Was a laboratory control standard run with each analytical batch of 20 samples or less?	Yes 🔄	No [_]	N/A []	Comments:
ACTION:	target, second source LCS is required by MADEP. Call laboratory for LCS form submittal. If data are not available, use udgement to evaluate data accuracy associated with that batch.				
5.2	Is a LCS Summary Form present?	Yes 🔟	No [_]	N/A []	Comments:
ACTION: 1	no, contact lab for resubmission of missing data.			/	
5.3	Is the recovery of any analyte outside of MADEP control limits? MADEP	Yes []	No 🗹	N/A [_]	Comments:
Sample	Type % Rec				
Water	80-120				
Soil	within Lab generated limits				
ACTION:	If recovery is above the upper limit, qualify all positive sample results				
	tch as (J). If recovery is below the lower limit, qualify all positive and				
	esults within the batch as (J). If LCS recovery is <30%, positive and non-				
	are rejected (R).				

Comments:

Yes [No [] N/A [] Comments: MS for total AI, Cr, No performed on single OC-PZ IPRSW (3W-1999)

Yes | No | No | N/A | 1

6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

Were project-specific MS/MSDs collected? List project samples that were spiked.

ACTION: If no, contact senior chemist to see if any were specified.

6.2 Is the Matrix Spike/Matrix Spike Duplicate Recovery Form present?

NOTE: A <u>full</u> target, second source MS/MSD is required by MADEP.

ACTION: If any matrix spike data are missing, call lab for resubmission.

6.3 Were matrix spikes analyzed as indicated on the COC and project schedule?

ACTION: If any matrix spike data are missing, call lab for resubmission. If none, no qualification is needed. Narrate non-compliance.

6.4 Are any metal spike recoveries outside of the QC limits?

MADEP	QAPP		
% Rec	% Rec	Method	
75-125	N/A	6010B	
N/A	70-130	200.7	
75-125	75-125	6010B	
	% Rec 75-125 N/A	% Rec % Rec 75-125 N/A N/A 70-130	

NOTE:
$$%R = (SSR-SR) \times 100\%$$

Where: SSR = Spiked sample result SR = Sample result

SA = Spike added

NOTE: If dilutions are required due to high sample concentrations (> 4X spike), the data are evaluated, but no flags are applied.

NOTE: If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.

ACTION: MS/MSD flags only apply to the sample spiked. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify positive results and non-detects (J).

6.5 Are any RPDs for MS/MSD recoveries outside of the OC limits?

NOTE: RPD = S-D x 100% (S+D)/2

Where: S = MS sample result

D = MSD sample result

uso not only zol.

NOTE: If dilutions are required due to high sample concentrations, the data are evaluated, but no flags are applied.

ACTION: If the RPD exceeds the control limit, qualify positive results and non-detects (J).

7.0 Laboratory Duplicate

7.1 Was a laboratory duplicate sample analyzed? If so, is the Laboratory Yes **Duplicate Sample Form present?**

NOTE: MADEP refers to this sample as a "matrix duplicate".

ACTION: If not analyzed, qualification is not needed. If data is missing, contact laboratory for resubmission of report. Narrate non-compliance.

7.2 Is the RPD between the result for the laboratory duplicate sample and the result for the parent sample outside of the QA/QC limits?

MADEP Laboratory Duplicate Sample RPD Criteria: QAPP RPD For aqueous results > $5 \times RL$, RPD must be $\pm 20\%$ 20 For aqueous results < $5 \times RL$, RPD must be $\leq RL$ 20 For soil/sediment results > $5 \times RL$, RPD must be $\pm 35\%$ 20 For soil/sediment results < $5 \times RL$, RPD must be $\leq 2 \times RL$ 20 ACTION: If the RPD exceeds the limits, qualify both positive results and non-detects as estimated and flag them J. Narrate non-compliance		
8.0 Sampling Accuracy		
The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.		
8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.	Yes []	No N/A Comments:
8.2 Do any rinsate blanks have positive results? NOTE: MADEP does not require the collection of rinsate blanks.	Yes [_]	No N/A Comments:
ACTION: Evaluate rinsate results against blank results to determine if contaminant may be laboratory-derived. If results are not lab-related, qualify according to below.		
If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.		
If the sample concentration is $> 5 \times$ blank value, no qualification is needed.		
9.0 <u>Field Duplicates</u>		7
9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.	Yes [_]	No N/A Comments:

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	9.2 Were field duplicates collected per the required frequency?	Yes []	No [_]	N/A	Comments:	
SO	W □ QAPP (1 per 10) □ MADEP Option 1 (1 per 20) □ MADEP Option 3 (1 per 10) □					
	9.3 Was the RPD \leq 50% for soils or waters? Calculate the RPD for all results and attach to this review.	Yes []	No []	N/A	Comments:	
ACTIO	ON: RPD must be ≤50% for soil and water. Qualify data (J) for both sample results	if the RPD e	xceeds 50	%.		
10.0	Special QA/QC					
		,	/			
	10.1 Were both total and dissolved metals analysis performed? If so, the dissolved metal concentration should not exceed that of the total metal.	Yes [No []	N/A []	Comments:	
A COT	TON: If and the first and and the state of the post of the state of th		-	1-1		
disso	ION: If results for both total and dissolved are $\geq 5x$ the PQL and the dissolved entration is 10% higher than the total, flag both results as estimated (J). If total and lived concentrations are less than $5x$ the PQL and the difference exceeds $2x$ the	T	otel	and di	noted	alumm and
PQL,	ng both results as estimated (J)	2.5	jodin	n in	sayle	OC-Isce I
			(360	- 199 17	-2) a	ed Godin in
			Say	le 0c.	-ISC03	(360-19919-4)
			usre	7 then	. total for	rosten. Rewitt
			for	alun	inum u.	I soliem in sope
			(233)	· C - T	sec) 1 am	1 slim in soly
6010.do				00-7	Se0 3 4	er solital estimate
	9 of 10			6	3). (7	o).

10.0	Application of Validation Qualifiers			
	Was any of the data qualified?	Yes [_[]	No [_] N/A [_]	Comments:
If so, ap	ply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in data	abase.		
REFE	RENCES			
LAW,	1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Ea Services, Kennesaw, GA 30144. August 1999	mes Street	t, Wilmington, MA",	LAW Engineering and Environmenta
U.S. E	nvironmental Protection Agency (USEPA), 1989. "Region 1 Laboratory Data Hazardous Site Evaluation Division; February 1989.	Validation	Functional Guidelines	s For Evaluating Inorganic Analyses'
MADE	P, 2001. Massachusetts Department of Environmental Protection Bureau of Wast (QA/QC) Requirements." BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October		anup, "Massachusetts (Quality Assurance and Quality Contro
MADE	EP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Sampling, Data Evaluation and Reporting Activities," BWSC-CAM, Section VII,			

Version 3, October 2008

OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

Reviewer/Date Mallilla No	1/10.1
Sr. Review/Date (NYS (3) cor di	11/15/10
Lab Report # 3 6 0 - 29919-1	
Project # 610 7100016.13	

Suitic conductance nitrate, nitrite, chloride, sulfate, ammonia

Note: The following analyses will be evaluated according to the "MADEP QA/QC Guidelines for Sampling, Data Evaluation and Reporting Activities." MADEP, however, may not list QA/QC criteria for every chemical analysis. Where not defined by MADEP, criteria will default to values stipulated in the QAPP. Where the QAPP does not define criteria, QA/QC requirements will default to limits employed by the laboratory.

	not define criteria, QA/QC requirements will default to limits employed by the laboratory.				(a a a a a a a a a a a a a a a a a a a
1.0	Laboratory Deliverable Requirements				
	1.1 Laboratory Information : Was all of the following provided in the laboratory report? Check items received.	Yes 🕒	No [_]	N/A [_]	Comments:
	☑ Name of Laboratory ☑ Address ☑ Project ID ☑ Phone #	☐ Sample	e identificatio	n – Field and	Laboratory
	Client Information:	(IDs must b	e cross-refer	enced)	1 10025
ACTIO	ON: If no, contact lab for submission of missing or illegible information.				
	1.2 Laboratory Report Certification Statement	Yes [No [_]	N/A [_]	Comments:
	Does the laboratory report include a completed Analytical Report Certification in the r	required form	nat?		
ACTIO	N: If no, contact lab for submission of missing certification or certification with correct t	format.			
	1.3 Laboratory Case Narrative:	Yes [_]	No []	N/A [_]	Comments:
	Narrative serves as an exception report for the project and method QA/QC performance.	. 🛮 🗆 Na	rrative includ	es an explana	ntion of each discrepancy on the
			fication State		
ACTIO	N: If no, contact lab for submission of missing or illegible information.				
	1.4 Chain of Custody (COC) copy present with all documentation completed?	Yes 🖊	No [_]	N/A []	Comments:
	Does the laboratory report include copies of Chain of Custody forms containing all samples in	this SDG?			
	NOTE: Olin receives and maintains the original COC.				
ACTIO	N: If no, contact lab for submission of copy of missing completed COC.				
	1.5 Sample Receipt Information (Cooler Receipt Form): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?				

		Yes 🗾	No [_]	N/A []	Comments:		
☐ Sample temperature	confirmed: must be 1° - 10° C. (If samples were sent by courier and delivered or	n the same d	ay as collecti	on, temperatur	re requirement does not apply).		
Container type noted Condition observed pH verified (where applicable) Field and lab IDs cross referenced							
1.5.1 Ammonia,– Oil & Grease	ct lab for submission of missing or incomplete documentation. Were the correct bottles and preservatives used? Liter polyethylene/H ₂ SO ₄ to pH<2,cool to 4°C Liter glass/HCL or H2SO4 to pH<2,cool to 4°C Liter polyethylene/cool to 4°C	Yes 🔼	No [_]	N/A [_]	Comments:		
Chloride, pH Nitrate/nitrite Organic Carl	kygen Demand – 50 mL polyethylene/H ₂ SO ₄ to pH<2,cool to 4°C l, sulfate, nitrate, nitrite - 50 mL polyethylene/cool to 4°C e - H2SO4 to pH<2,cool to 4°C bon – 500 mL amber glass bottle/HCl or H ₂ SO ₄ to pH<2,cool to 4°C mL polyethylene/ZnAcetate + NaOH to pH>9, cool to 4°C						
Phenolics - H	H ₂ SO ₄ to pH<2,cool to 4°C						
Specific con	ductance, TDS, TSS – 100 mL polyethylene/cool to 4°C						
container/volume (if	inform senior chemist. Document justification for change in applicable), qualify positive and non-detect data (J) data if cooler 10°C. Rejection of data requires professional judgment						
1.5.2	Were all samples delivered to the laboratory without breakage?	Yes 🗾	No [_]	N/A []	Comments:		
1.5.3	Does the <i>Cooler Receipt Form</i> or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?	Yes []	No 🔝	N/A 📋	Comments:		

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1.6 Sample Results report for each san	Section: Was the following in nple?	nformation supplied in the	laboratory Yes [No [_] N/A	A [_]	Comments:
Field ID and Lab ID Clean-up method	Date and time collected Analysis method	Analyst Initials Preparation method	Date of preparation	actor lactor/diges	moi	sture or solids Reporting limits up and analysis, where applicable
☑ Matrix ☑	Target analytes and concentra	tions	Units (soils must b			• • • • • • • • • • • • • • • • • • • •
ACTION: If no, contact lab for				,	9 /	
		•				
1.7 QA/QC Information for each sample batch?	on: Was the following information	ation provided in the laborat	ory report Yes	No [_] N//	A [_]	Comments:
	/ IA	10	/			
Method blank results	CS recoveries MS/MSD	recoveries and RPDs	aboratory duplicate resu	lts (where applica	able)	
ACTION: If no, contact lab for	submission of missing or incor	nplete information.				
		•				
				/ midPl	leo	
2.0 Holding Times			Yes 💽	No No	A _]	Comments: Due to a lab ever, Sangle OX-PZ 17 RASW was follows: analyze 3 Hours beg
Have any technical hol	ding times, determined from d	late of collection to date of	analysis, been exceeded	? The holding ti	mes are as	soull OC-PE (7 RASC) was
28 days = ammor	nia, chemical oxygen demand,	chloride, organic carbon, o	il & grease, specific con	ductance, total o	organic car	bon and sulfate
Alkalinity = 14 d		TDS, TSS = 7 days				itrogen as N = 48 hrs
Nitrite nitrogen a		+ Nitrite as N = 28 days				for nitrate. The
	at exceed hold time with # of d	•				perult was qualiful estim
			s that are grossly excee	ded (>2X hold to	ime) rejec	t (R) all non-detect results. Professional
				,		
3.0 Laboratory M	ethod		Yes 🗾	No [_] N//	A [_]	Comments:
3.1 Was the correct labor	oratory method used?					
ACTION: If no, contact lab to p	rovide justification for method	change compared to the requ	uested method. Contact s	senior chemist to	inform Cli	ent of change or to request variance.

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	3.2 Are the practical quantitation ☐ QAPP/IRSWP ☐ Lab?	limits the same as those spec	ified by	the Yes [_]	No [N/A [_]	Comments:	
	Note: The MADEP QA/QC Guidelines of therefore all criteria will default to values st define criteria, QA/QC requirements defa may also apply.	tipulated in the QAPP*. Where the Q	APP does	not	ns act	r spec con	I puberlen	
	Ammonia* = 0.1 mg/ L	Alkalinity**□ = 1 mg/L		Bicarbonate All	kalinity**	= 1 mg/L	Carbonate Alkalinity** □ = 1 n	ng/L
	Nitrate Nitrogen as N* = .05 mg/L	Nitrite Nitrogen as N* ■ = .01 m	ng/L	Chloride*	T mg/L		Hardness *□ = 2 mg/L	
	Spec. Cond.** 3 umhos/cm	Total Organic Carbon** □ = 1 n	ng/L	Oil & Grease*	□ = 5.5 mg	/L	Sulfate (EPA 300.0)*	mg/L
	COD:* Low – 20 mg/L	COD* High - 50 mg/L □		TDS* □ = 10	mg/L		TSS* □ = 5 mg/L	
	pH* □ < 2 to > 12	Phenolic - 0.01 mg/L						
	Other parameter(list)	PQL =	□ Sour	ce of PQL =				
	Other parameter(list)	PQL =		ce of PQL =				
ACTIO	N: If no, evaluate change with respect to sa	imple matrix, preparation, dilution, n	noisture, etc	c. If sample PQL	is indetermi	nate, contact l	ab for explanation.	
					/			
	3.3 Are the appropriate parameter results p	present for each sample in the SDG?		Yes	No [_]	N/A []	Comments:	
ACTIO	N: If no, check Request for Analysis to veri	fy if method was ordered and COC	to verify that	at it was sent, and	d contact lab	for resubmissi	on of the missing data	
	3.4 If dilutions were required, were dilution	factors reported?		Yes [_]	No [_]	N/A []	Comments:	
ACTIO	N: If no, contact the lab for submission.							
4.0	Method Blanks			Yes 🔄	No [_]	N/A []	Comments:	
	4.1 Are the Method Blank Summaries pres	sent?						
ACTIO	N: If no, call the laboratory for submission	of missing data.						
	4.2 Was a method blank analyzed for each 20 or less?	h analysis batch of wet chemistry fie	ld samples	of Yes 🕒	No [_]	N/A [_]	Comments:	

ACTIO	N: If no,	document discrepancy in case narrative and contact lab for justification. Consult seni	or chemist fo	or action need	ded.	
	4.3 Is the	e method blank less than the PQL? (See Section 3.2 for PQLs).	Yes 🔄	No [_]	N/A []	Comments:
		ny method blanks have positive results for wet chemistry parameters? Qualify data g to the following:	Yes []	No 🗹	N/A [_]	Comments:
		mple concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the concentration reported if greater than the PQL.				
	If the sar	mple concentration is $> 5 \times$ blank value, no qualification is needed.				
ACTIO qualifie		y blank has positive results, list all the concentrations detected and flagging level (fla	gging level	= 5 × blank v	ralue) on the c	hecklist. List all affected samples and their
	Y - Y					
5.0	Laborat	tory Control Standards	/			
	5.1	Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less?	Yes [No [_]	N/A []	Comments:
		call laboratory for LCS form submittal. If data is not available, use professional mine qualification actions for data associated with the batch.	7			
	5.2	Is a LCS Summary Form present?	Yes [_]	No [_]	N/A [_]	Comments:
ACTIO	N: If no,	contact lab for resubmission of missing data.		j.		
	5.3	Is any wet chemistry analyte LCS recovery outside the control limits?	Yes []	No [_]	N/A [_]	Comments:

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	_				
10	10		1	4	
LC		1.4	mı	IS	2

	LCS Limits:								
	Alkalinity** □ = 80-120% Total Organic Carbon** □ = 80-120% COD Low* □ = 80-120% Hardness* □ = 80-120%	Bicarbonate Alkalinity** □ = 80-120% TDS** □ = 80-120% COD High* □ = 80-120% Chloride* ☑ = 80-120%	Carbonate Alkalinit Oil & Grease* □ = Nitrate Nitrogen Sulfate (EPA 300.0	= 80-120% as N**□ =	80-120%	Specific Conductivity *E Ammonia Nitrogen as N Nitrite Nitrogen as N* pH* □ = 98-102%	* 🗷 = 80-120%		
	Other parameter(list)	%R =		□ Rec Lir	nits=				
	Other parameter(list)	%R =		☐ Rec Lir	nits =				
	(MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)								
ACTIO within the	ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and no-detect results within the batch as (J). If LCS recovery is <10%, non-detect results are rejected (R).								
6.0	Matrix Spikes								
		requencies based on monthly, quarterly, ents for each set with the senior chemist.	or task						
	6.1 Were project-specific MS/MSDs	s analyzed? List project samples that were sp		/					
ACTIO	N: If no, contact senior chemist to see if a		Yes []	No [/]	N/A	Comments:			
ACTIO	6.2 Is the MS/MSD Recovery Form N: If no, contact lab for resubmission of		Yes []	No []	N/A [_]	Comments:			
	6.3 Were matrix spikes analyzed matrix?	at the required frequency of 1 per 20 samp	les per	No[]	N/A [/]	Comments:			
ACTIO	N: If any matrix spike data is missing, ca	Il lab for resubmission.				/			
	6.4 Are any wet chemistry analyte	spike recoveries outside of the QC limits?	Yes []	No []	N/A 🔼	Comments:			

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	NOTE: %R SA	Aut	SSR-SR)		00% A = Spike add	ed			Where:		SSR	=	Spiked SR	sample = Samp	
	MS/MSD Recovery Limits:														
	Alkalinity* = NA		Bicarbo	onate All	kalinity* = NA	1	Carbonate alkalinity	* = NA		Ammoni	ia* (LA	CHA	Γ) 🗆 = 75	5-125%	
	Chloride*(SM 4500 Cl) □= 7	5-125%	Specifi	c Condu	ctivity * = NA		Total Organic Carbo	on* = NA		TDS**			,		
	Oil & Grease* = NA		COD L	.ow* □	= 75-125%		COD High* □ = 75	-125%		Nitrate N	Vitrogen	as N	** 🗆 = 75	5-125%	
	Nitrite Nitrogen as N** □ = 7	5-125%	Hardne	ess* 🗆 =	= 75-125%		Sulfate (EPA 300.0))* 🗆 = 75							
	Other parameter(list)				%										
	* = Laboratory Limits	**=	Olin QAPP	Limits	(MADEP h	nas not ye	et defined LCS red	covery lin	nits for w	et chem	nistry a	nalys	es.)		
	NOTES: 1) If only one of the 2) If the MS/MSD w	recoveries as perform	for an MS/Ned by the lal	MSD pai	ir is outside of on a non-proje	the contro	ol limits, no qualific e, no qualification is	ation is ne required.	cessary.	Use prof	fessiona	al judg	gment for	the MS/MS	D flags.
qualify	N: MS/MSD flags only apply to positive results as estimated (J). D recovery is < 30% and the sai	. If the reco	overies of the	ne MS ar	nd MSD are lo	ower than	the lower control li	e. If the reimit but >	ecoveries 30%, qu	of the Malify bot	IS and I	MSD o	exceed the sults and r	e upper con non-detects	trol limit, (J). If the
ACTIO evaluate	N: Laboratory control limits and, but no flags are applied.	pply when	spiked samp	ole result	ts fall within t	he norma	calibration range.	If dilution	s are req	uired du	e to hig	gh sam	ple conce	entrations, t	he data is
	6.5 Are any RPDs for MS/MS	D recoverie	es outside of	the QA	QC limits?					/	/				
	NOTE: RPD = $\frac{S-D}{(S+D)/2}$ x	100% W		S result ISD resu	ılt		Yes []	No [_	J N/A	A [Com	ments	:		
	Mc/McD DDD I imite.														
	MS/MSD RPD Limits:														
	RPD ≤20														
7.0	Laboratory Duplicate														
	Are the RPDs for the laborato	ry duplicat	tes <20% un	nless oth	erwise specifi	ed below	? Yes []	No [N/A	A [_]	Com	ments:			

ACTIO	N: If the RPD is greater than	specified limits, qualify all results for tha	t analyte as estimated (J)						
	pH* □ = 3%	Specific Conductivity *□ = 5%	TSS** □ = 6%		Т	DS** □ = 6%	6		
8.0	Sampling Accuracy								
The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.									
	8.1 Were rinsate blanks col associated samples from the	llected? Prior to evaluating rinsate blan senior chemist.	ks, obtain a list of the	Yes []	No [N/A [_]	Comments:		
	8.2 Do any rinsate blanks have	ve positive results?		Yes []	No []	N/A	Comments:		
ACTI		s vs. blank results to determine if con is $< 5 \times$ blank value, flag sample result no						to the table below.	
	If the sample concentration	is $> 5 \times$ blank value, no qualification is no	eeded.						
NOTE	MADEP does not require t	the collection of rinsate blanks.							
9.0	Field Duplicates				,	2			
	9.1 Were field duplicate s field duplicates.	samples collected? Obtain a list of samp	les and their associated	Yes []	No [N/A []	Comments:		
	9.2 Were field duplicates co	ollected per the required frequency?		Yes []	No [_]	N/A [_]	Comments:		
QA	PP/IRSWP □ MADEP O	ption 1(1 per 20) MADEP Optio	n 3 (1 per 10) 🏻			/			
	9.3 Was the RPD \leq 30% for attach to this review.	waters < 50% for soils? Calculate the	RPD for results and	Yes []	No [_]	N/A	Comments:		

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ACTION:. Qualify data (J) for both sample results if the RPD exceeded.	
Was any of the data qualified?	Yes No No N/A Comments:
If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.	
REFERENCES:-	
MACTEC, 2007. "Draft Interim Response Steps Work Plan"; Olin Chemical Superfund Site, 51 E 25, 2007.	Eames Street, Wilmington, Massachusetts.; Project No. 6300-06-0010/41.1; Jul

Massachusetts Department of Environmental Protection (MADEP), 2004. "The Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; May 2004.

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Version 1.2, Nov 2002

OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

Reviewer/Date Chris Ricard 11210

Lab Report # 360-30036-1

Project # 6607100016. (2

total /dissolut alungium chonjum sorliem.	
1.0 <u>Laboratory Deliverable Requirements</u>	
1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes <a>[<a> <a>Check items received.	No [] N/A [] Comments:
Name of Laboratory Address Project ID Phone # Sample	e identification – Field and Laboratory
Client Information:	Os must be cross-referenced)
ACTION: If no, contact lab for submission of missing or illegible information.	
1.2 Laboratory Report Certification Statement Yes	No [_] N/A [_] Comments:
Does the laboratory report include a completed Analytical Report Certification in the required format?	
ACTION: If no, contact lab for submission of missing certification or certification with correct format.	
1.3 Laboratory Case Narrative: Yes [_]	No [_] N/A [_] Comments:
Narrative serves as an exception report for the project and method QA/QC performance.	☐ Narrative includes an explanation of each discrepancy
	Certification Statement.
ACTION: If no, contact lab for submission of missing or illegible information.	
1.4 Chain of Custody (COC) copy present with all documentation completed Yes	No [_] N/A [_] Comments:
NOTE: Olin receives and maintains the original COC.	
ACTION: If no, contact lab for submission of copy of completed COC.	

•	Receipt Information (Cooler Receipt Form present?): The following tasks completed and recorded upon receipt of the sample(s) atory?	Yes []	No 🗹	N/A [_]	Comments:	temp not	0.0°C	-
	confirmed: must be 1° − 10° C. (If samples were sent by courier and delivered sample condition observed pH verified (where applicable) Field an				ture requiremen	nt does not app	ly).	•
ACTION: If no, conta	act lab for submission of missing or incomplete documentation.							
1.5.1	Were all samples delivered to the laboratory without breakage?	Yes 🗾	No [_]	N/A [_]	Comments:			
1.5.2	Does the <i>Cooler Receipt Form</i> or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?	Yes 🗾	No []	N/A [_]	Comments:	Syle.	lenge C	0,0
	Results Section: Was each of the following requirements supplied in the y report for each sample?	Yes []	No [_]	N/A [_]	Comments:			
Diffeld ID and Lab	Analysis method Preparation method	Dilution F Date of priits (soils must	eparation/e	extraction/dige	moisture or soli estion clean-up t)		Reporting where appl	
1.7 QA/QC	act lab for submission of missing or incomplete information. Information: Was each of the following information supplied in the port for each sample batch?	Yes 🔟	No [_]	N/A [_]	Comments:			

/		/	/					
Meth	od blank results	LCS recoverie	s MS/MSD recoveries and R	PDs Laboratory	duplicate resu	lts (where	applicable)	
ACTIO	N: If no, contact la	ab for submission	of missing or incomplete information	on.				
2.0	Holding Times					,	/	
			ned from date of collection to da is 180 days from sample collection			No 🔝	N/A]	Comments:
NOTE:	List samples that of	exceed hold time w	ith # of days exceeded on checklist					
			sceeded, qualify all positive results ng time) reject (R) all non-detect re					
3.0	Laboratory M	ethod				/		
	3.1 Was th	e correct laborate	ory method used?		Yes 🔝	No []	N/A []	Comments:
		Digestion igestion	3005A or 3010A or 3020A 3050B 6010B or 200.7					
comp		iested method. C	y to provide justification fo ontact senior chemist to inform			/		
		e practical quant	itation limits the same as thos	e specified by the	Yes 🗾	No []	N/A []	Comments:
NOT	E: Verify that the r	reported metals ma	tch the target list specified on the 0	COC.				
6010.dc	oc							

	: If no, evaluate variation with respect to sample matrix, preparation, dilution, etc. If sample PQL is indeterminate, contact lab for explanation.	/			
3.3	Are results present for each sample in the SDG?	Yes 📗	No [_]	N/A []	Comments:
ACTION: If	no, check Request for Analysis to verify if method was ordered and COC to verify that it	t was sent, and	d contact la	b for resubmi	ssion of the missi
3.4	If dilutions were required, were dilution factors reported?	Yes 🗾	No [_]	N/A []	Comments:
ACTION: If	no, contact the lab for submission.				
4.0 <u>Me</u>	thod Blanks	/			
4.1	Is the Method Blank Summary present?	Yes [No [_]	N/A []	Comments:
ACTION	: If no, call the laboratory for submission of missing data.				
4.2	Frequency of Analysis: Was a method blank analyzed for each digestion batch of < 20 field samples?	Yes 🔟	No [_]	N/A [_]	Comments:
	: If no, contact laboratory for justification. Consult senior chemist for action arrate non-compliance.				
4.3	Is the method blank less than the PQLs for all target elements?	Yes [/]	No []	N/A []	Comments:
NOTE: M samples	IADEP requires the method blank to be matrix matched and digested with the			/	
4.4 the t	Do any method blanks have positive results for metals? Qualify data according to following:	Yes []	No L	N/A [_]	Comments:
6010.doc					
0010.000					

4 of 10

If the sample concentration is $< 5 \times$ blank value	, flag sample result non-detect "U" at the
PQL or the concentration reported if greater that	n the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

ACTION: For any blank with positive results, list all contaminants for each method blank including the concentration detected and the flagging level (flagging level = 5x the blank value) and the associated samples and qualifiers.

5.0	Labor	ratory Control Standard				
	5.1	Was a laboratory control standard run with each analytical batch of 20 samples or less?	Yes 🗾	No [_]	N/A []	Comments:
ACT	ION:	It target, second source LCS is required by MADEP. Call laboratory for LCS form submittal. If data are not available, use judgement to evaluate data accuracy associated with that batch.		/		
	5.2	Is a LCS Summary Form present?	Yes [No []	N/A []	Comments:
ACT	ION: 1	If no, contact lab for resubmission of missing data.				
	5.3 Sampl Water	Is the recovery of any analyte outside of MADEP control limits? MADEP e Type	Yes []	No 📈	N/A [_]	Comments:
	Soil	within Lab generated limits				
withi	n the b	If recovery is above the upper limit, qualify all positive sample results atch as (J). If recovery is below the lower limit, qualify all positive and results within the batch as (J). If LCS recovery is <30%, positive and nonsare rejected (R).				

Comments:

6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

Were project-specific MS/MSDs evellected? List project samples that were 6.1 @10/3/D

Yes No No N/A Comments: Sych OC-501 750

ACTION: If no, contact senior chemist to see if any were specified.

Is the Matrix Spike/Matrix Spike Duplicate Recovery Form present? 6.2

No [] N/A [] Comments:

NOTE: A full target, second source MS/MSD is required by MADEP.

ACTION: If any matrix spike data are missing, call lab for resubmission.

Were matrix spikes analyzed as indicated on the COC and project 6.3 schedule?

ACTION: If any matrix spike data are missing, call lab for resubmission. If none, no qualification is needed. Narrate non-compliance.

Are any metal spike recoveries outside of the QC limits? 6.4

	MADEP	QAPP	
Sample Type	% Rec	% Rec	Method
Water	75-125	N/A	6010B
Water	N/A	70-130	200.7
Soil	75-125	75-125	6010B

NOTE:
$$%R = (SSR-SR) \times 100\%$$

Where:
$$SSR = Spiked sample result$$

 $SR = Sample result$

NOTE: If dilutions are required due to high sample concentrations (> 4X spike), the data are evaluated, but no flags are applied.

NOTE: If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.

ACTION: MS/MSD flags only apply to the sample spiked. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify positive results and non-detects (J).

6.5 Are any RPDs for MS/MSD recoveries outside of the QC limits?

No No N/A Comments

NOTE: RPD = S-D x 100% (S+D)/2

Where: S = MS sample result D = MSD sample result

NO MSIS

NOTE: If dilutions are required due to high sample concentrations, the data are evaluated, but no flags are applied.

ACTION: If the RPD exceeds the control limit, qualify positive results and non-detects (J).

7.0 Laboratory Duplicate

7.1 Was a laboratory duplicate sample analyzed? If so, is the Laboratory Yes No N/A Comments: Duplicate Sample Form present?

NOTE: MADEP refers to this sample as a "matrix duplicate".

ACTION: If not analyzed, qualification is not needed. If data is missing, contact laboratory for resubmission of report. Narrate non-compliance.

7.2 Is the RPD between the result for the laboratory duplicate sample and the result for the parent sample outside of the QA/QC limits?

Yes No N/A Comments

MADEP Laboratory Duplicate Sample RPD Criteria:	QAPP RPD
For aqueous results > $5 \times RL$, RPD must be $\pm 20\%$	20
For aqueous results < 5× RL, RPD must be ≤ RL	20
For soil/sediment results > $5 \times$ RL, RPD must be $\pm 35\%$	20
For soil/sediment results $< 5 \times RL$, RPD must be $\le 2 \times RL$	20
ION: If the RPD exceeds the limits, qualify both positi	ve results and n

ACTION: If the RPD exceeds the limits, qualify both positive results and non-detects as estimated and flag them J. Narrate non-compliance

8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

- 8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.
 - es No N/A Comments

8.2 Do any rinsate blanks have positive results?

Yes No No NA Comments

NOTE: MADEP does not require the collection of rinsate blanks.

ACTION: Evaluate rinsate results against blank results to determine if contaminant may be laboratory-derived. If results are not lab-related, qualify according to below.

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.

Yes No No N/A Comments

9.2 Were field duplicates collected per the required frequency?		Yes []	No [_]	N/A [Comments:		
SOW □ QAPP (1 per 10) □ MADEP Option 1 (1 per 20) □ MADEP Option	ption 3 (1 per 10) 🏻			/	/		
9.3 Was the RPD \leq 50% for soils or waters? Calculate the RPD f attach to this review.	for all results and	Yes []	No []	N/A	Comments:		
ACTION : RPD must be \leq 50% for soil and water. Qualify data (J) for bo	oth sample results if	the RPD ex	ceeds 50	% .			
10.0 Special QA/QC							
10.1 Were both total and dissolved metals analysis perform dissolved metal concentration should not exceed that of the total		Yes [No []	N/A []	Comments:		
ACTION: If results for both total and dissolved are $\geq 5x$ the PQL a concentration is 10% higher than the total, flag both results as estimate dissolved concentrations are less than 5x the PQL and the difference PQL, flag both results as estimated (J)	ed (J). If total and see exceeds 2x the					> To	
	T	_	99,0	200			
	7) 1	20,0	200			
	9	2	-1	ext	mAe	(odiun	defu(J)
							(T)

10.0	Application	of Validation	Oualifiers
------	-------------	---------------	-------------------

Was any of the data qualified?

Yes No NA Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.

REFERENCES

- LAW, 1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Street, Wilmington, MA", LAW Engineering and Environmental Services, Kennesaw, GA 30144. August 1999
- U.S. Environmental Protection Agency (USEPA), 1989. "Region 1 Laboratory Data Validation Functional Guidelines For Evaluating Inorganic Analyses"; Hazardous Site Evaluation Division; February 1989.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Massachusetts Quality Assurance and Quality Control (QA/QC) Requirements." BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance and Quality Control Guidelines for Sampling, Data Evaluation and Reporting Activities," BWSC-CAM, Section VII, Public Comment Draft, Revision No. 0, 21 December 2001.

Version 3, October 2008

OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

Reviewer/Date	Und	Cloke,	10/2/
Sr. Review/Date	Chas	Quard	1 11 15 K
Lab Report #	340-30		1 /
Project # 1 100	710001601	>	

	Note: The following analyses will be evaluated according to the "MADEP QA/QC Gui however, may not list QA/QC criteria for every chemical analysis. Where not defined by MA not define criteria, QA/QC requirements will default to limits employed by the laboratory.				
1.0	Laboratory Deliverable Requirements				
	1.1 Laboratory Information: Was all of the following provided in the laboratory report? Check items received.	Yes 🗾	No [_]	N/A []	Comments:
	Name of Laboratory	Sample	identificatio	n – Field and	Laboratory
	☐ Name of Laboratory ☐ Address ☐ Project ID ☐ Phone # Client Information: ☐ Name ☐ Address ☐ Client Contact	(IDs must be			•
ACTIO	N: If no, contact lab for submission of missing or illegible information.				
	1.2 Laboratory Report Certification Statement	Yes [_]	No [_]	N/A [_]	Comments:
	Does the laboratory report include a completed Analytical Report Certification in the r	equired form	nat?		
ACTIO	N: If no, contact lab for submission of missing certification or certification with correct t	iormat.			
	1.3 Laboratory Case Narrative:	Yes []	No [_]	N/A [_]	Comments:
	Narrative serves as an exception report for the project and method QA/QC performance.		rative includ		ation of each discrepancy on the
АСТІО	N: If no, contact lab for submission of missing or illegible information.	/			
	1.4 Chain of Custody (COC) copy present with all documentation completed?	Yes [_]	No [_]	N/A []	Comments:
	Does the laboratory report include copies of Chain of Custody forms containing all samples in	this SDG?			
	NOTE: Olin receives and maintains the original COC.				
ACTIO	N: If no, contact lab for submission of copy of missing completed COC.				
	1.5 Sample Receipt Information (Cooler Receipt Form): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?				

		Yes 🔄	No 🔄	N/A [_]	Comments:	tey o	102 tom.
	ed: must be $1^{\circ} - 10^{\circ}$ C. (If samples were sent by courier and delivered o	n the same da	y as collecti	on, temperatur	e requirement	does not apply	t form.
☐ Container type noted ☐ Co	ondition observed pH verified (where applicable) Field and lab II	Os cross refer	enced				
1.5.1 Were Ammonia,– 1 Liter	or submission of missing or incomplete documentation. the correct bottles and preservatives used? polyethylene/H ₂ SO ₄ to pH<2,cool to 4°C iter glass/HCL or H2SO4 to pH<2,cool to 4°C	Yes 🗹	No [_]	N/A []	Comments:		
Chemical Oxygen D	polyethylene/cool to 4°C Demand – 50 mL polyethylene/H ₂ SO ₄ to pH<2,cool to 4°C te, nitrate, nitrite - 50 mL polyethylene/cool to 4°C						
√ Nitrate/nitrite - H2S Organic Carbon – 5	SO4 to pH<2,cool to 4°C 00 mL amber glass bottle/HCl or H ₂ SO ₄ to pH<2,cool to 4°C lyethylene/ZnAcetate + NaOH to pH>9, cool to 4°C						
Phenolics - H ₂ SO ₄ to Specific conductance	ce, TDS, TSS – 100 mL polyethylene/cool to 4°C						
container/volume (if applic	m senior chemist. Document justification for change in cable), qualify positive and non-detect data (J) data if cooler Rejection of data requires professional judgment						
1.5.2 Were a	all samples delivered to the laboratory without breakage?	Yes L	No [_]	N/A []	Comments:		
sample	the Cooler Receipt Form or Lab Narrative indicate other problems with the receipt, condition of the samples, analytical problems or special estances affecting the quality of the data?	Yes 📝	No [_]	N/A [_]	Comments:	tep	0.0°C

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1.6 Sample Resu report for each	ults Section: Was the following a sample?	information supplied in the	laboratory Yes [No [_]	N/A [_]	Comments:	
Marield ID and Lab ID	Date and time collected	Analyst Initials Preparation method	Dilution Fa			isture or solids n-up and analysis, when	Reporting limits
☐ Matrix	☐ Target analytes and concent	rations	Units (soils must be	e reported in	dry weight)		
ACTION: If no, contact la	b for submission of missing or inc	complete information.					
1000-1000 001, 01 400 000 000 * 100 000 000 000 000 000 000 000 000 00	•						
1.7 QA/QC Information for each sample bar	mation: Was the following information?	nation provided in the laborat	ory report Yes	No [_]	N/A []	Comments:	
Method blank results	LCS recoveries MS/MSI	D recoveries and RPDs	A aboratory duplicate resul	lts (where ap	plicable)		
ACTION: If no contact lab	o for submission of missing or inc	omplete information					
ACTION. II iio, contact iat	o for submission of missing of me	ompiete information.					
				/			
2.0 Holding Times			Yes []	No 🖊	N/A]	Comments:	
Have any tacky in	1 halding times determined from	data of authorize to data of		o The held!	4!	6-11	
/	l holding times, determined from						
	nmonia, chemical oxygen deman						
Alkalinity =		e, TDS, TSS = 7 days	pH = analyze immedi	iately	Aftrate	nitrogen as $N = 48$ hrs	3
Nitrite nitrog	gen as N = 48 hrs Nitrat	e + Nitrite as N = 28 days					
NOTE: List sampl	es that exceed hold time with # of	days exceeded on checklist					
ACTION: If technical hol judgment used to qualify soi	lding times are exceeded qualify ils.	results (J). For water sample	s that are grossly exceed	ded (>2X ho	old time) reje	ct (R) all non-detect r	esults. Professional
3.0 Laborator	ry Method		Yes [No [_]	N/A []	Comments:	
3.1 Was the correct	t laboratory method used?						
ACTION: If no, contact lab	to provide justification for metho	d change compared to the req	uested method. Contact s	enior chemis	st to inform C	lient of change or to re	quest variance.

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				/		
	3.2 Are the practical quantitation I ☐ QAPP/IRSWP ☐ Lab?	limits the same as those specif	fied by the Ye	es No S	N/A []	Comments:
	Note: The MADEP QA/QC Guidelines de therefore all criteria will default to values sti define criteria, QA/QC requirements defau may also apply.	ipulated in the QAPP*. Where the QA	APP does not	Spec	an lan	nhes /com
	Ammonia* = 0.1 mg/ L	Alkalinity**□ = 1 mg/L	Bicarbo	onate Alkalinity** □	= 1 mg/L	Carbonate Alkalinity** □ = 1 mg/L
	Ammonia* $\Box = 0.1 \text{ mg/ L}$ Nitrate Nitrogen as N* $\Box = .05 \text{ mg/L}$	Nitrite Nitrogen as N* = .01 mg	g/L Chlori	de* 🗗 = 1 mg/L		Hardness *□ = 2 mg/L
	Spec. Cond.** 3 umhos/cm	Total Organic Carbon** □ = 1 m		Grease* □ = 5.5 mg	g/L	Sulfate (EPA 300.0)* = 2 mg/L
	COD:* Low - 20 mg/L	COD* High - 50 mg/L □	TDS*	□ = 10 mg/L		TSS* □ = 5 mg/L
	pH* □ <2 to > 12	Phenolic - 0.01 mg/L				
	Other parameter(list)					
	Other parameter(list)	PQL =	☐ Source of PC	QL =		
ACTIO	3.3 Are the appropriate parameter results p N: If no, check Request for Analysis to veri				N/A [_] for resubmissi	Comments: on of the missing data
	3.4 If dilutions were required, were dilution	factors reported?	Y	es No No	N/A []	Comments:
ACTIO	N: If no, contact the lab for submission.					
1.0	Method Blanks		Y	es No	N/A [_]	Comments:
	4.1 Are the Method Blank Summaries pres	eent?				
ACTIO	N: If no, call the laboratory for submission	of missing data.				
	4.2 Was a method blank analyzed for each 20 or less?	h analysis batch of wet chemistry field	d samples of	es No	N/A []	Comments:

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ACTIO	N: If no,	document discrepancy in case narrative and contact lab for justification. Consult senio	or chemist for	r action nee	ded.	
	4.3 Is the	e method blank less than the PQL? (See Section 3.2 for PQLs).	Yes 🗾	No [_]	N/A []	Comments:
			9			
		ny method blanks have positive results for wet chemistry parameters? Qualify data g to the following:	Yes [_]	No 🔝	N/A []	Comments:
		mple concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the the concentration reported if greater than the PQL.				
	If the sar	mple concentration is $> 5 \times$ blank value, no qualification is needed.				
ACTIO qualifier		y blank has positive results, list all the concentrations detected and flagging level (fla	gging level =	5 × blank	value) on the c	hecklist. List all affected samples and their
5.0	Laborat	tory Control Standards				
	5.1	Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less?	Yes 🔟	No []	N/A [_]	Comments:
		, call laboratory for LCS form submittal. If data is not available, use professional mine qualification actions for data associated with the batch.				
	5.2	Is a LCS Summary Form present?	Yes 🗾	No [_]	N/A []	Comments:
ACTIO	N: If no,	contact lab for resubmission of missing data.			/	
	5.3	Is any wet chemistry analyte LCS recovery outside the control limits?	Yes []	No 🔼	N/A [_]	Comments:

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LCS	Laure Labor	
LAG	Limits	Ξ

LC3 Lillits.						
Alkalinity** $\square = 80\text{-}120\%$ Total Organic Carbon** $\square = 80\text{-}120\%$ COD Low* $\square = 80\text{-}120\%$ Hardness* $\square = 80\text{-}120\%$	Bicarbonate Alkalinity** □ = 80-120% TDS** □ = 80-120% COD High* □ = 80-120% Chloride* □ = 80-120%	Carbonate Alkalinity Oil & Grease* □ = Nitrate Nitrogen a Sulfate (EPA 300.0	80-120% as N** = 80-	120%	Specific Conductivity * Ammonia Nitrogen as Nitrite Nitrogen as N pH* □ = 98-102%	N* = 80-120%
Other parameter(list)	%R =		☐ Rec Limits=			
Other parameter(list)	%R =		☐ Rec Limits =			
	(MADEP has not yet defined LCS recov	very limits for wet che	mistry analyses	s.)		
ACTION: If recovery is above the upper limit, within the batch as (J). If LCS recovery is <10%, 6.0 Matrix Spikes Matrix spikes may be collected at different for the spikes may be collected at different for the spikes may be collected.	, non-detect results are rejected (R).		ery is below the	lower lim	it, qualify all positive a	nd no-detect results
specific schedules. Confirm spike requirement						
6.1 Were project-specific MS/MSD ACTION: If no, contact senior chemist to see if a 6.2 Is the MS/MSD Recovery Form		Yes []	No No No	A [_]	Comments:	
ACTION: If no, contact lab for resubmission of	missing data.	Yes []	No [_] N/	A 🖸	Comments:	
6.3 Were matrix spikes analyzed matrix? ACTION: If any matrix spike data is missing, ca	at the required frequency of 1 per 20 sam all lab for resubmission.	ples per Yes []	No [_] N/	AL)	Comments:	
6.4 Are any wet chemistry analyte	spike recoveries outside of the QC limits?	Yes []	No [_] N/	A C	Comments:	

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	NOTE: %R = SA	(SSR-SR) x 100% SA = Spike added		Where:	SSR =	Spiked sample s	result result
	MS/MSD Recovery Limits:						
	Alkalinity* = NA	Bicarbonate Alkalinity* = NA	Carbonate alkalinity*	NA A	ammonia* (LACI	HAT) □ = 75-125%	
	Chloride*(SM 4500 CI) □= 75-125%	Specific Conductivity * = NA	Total Organic Carbon	* = NA T	$DS^{**} = NA$		
	Oil & Grease* = NA	COD Low* □ = 75-125%	COD High* □ = 75-1	25% N	litrate Nitrogen as	s N** □ = 75-125%	
	Nitrite Nitrogen as N** \square = 75-125%	Hardness* $\square = 75-125\%$	Sulfate (EPA 300.0)*	□ = 75-125% p	$H^* = NA$	TSS* = NA	
	Other parameter(list)	% R =		☐ Rec Limits	=		_
	* = Laboratory Limits **	= Olin QAPP Limits (MADEP has not	yet defined LCS reco	very limits for we	et chemistry ana	lyses.)	
		es for an MS/MSD pair is outside of the con med by the laboratory on a non-project sam			Use professional j	udgment for the MS/MSD fl	ags.
qualify p	positive results as estimated (J). If the re	apple spiked. Do not evaluate if sample concecoveries of the MS and MSD are lower that on-detect, the results are considered unusable	an the lower control lim				
	N: Laboratory control limits apply when d, but no flags are applied.	n spiked sample results fall within the norm	nal calibration range. If	dilutions are requ	ired due to high	sample concentrations, the d	ata is
	6.5 Are any RPDs for MS/MSD recover	ries outside of the QA/QC limits?					
	NOTE : RPD = $\frac{S - D}{(S + D)/2}$ x 100%	Where S = MS result D = MSD result	Yes []	No [_] N/A	Comme	ents:	
	MS/MSD RPD Limits:						
	RPD ≤20						
7.0	Laboratory Duplicate						
	Are the RPDs for the laboratory duplic	cates <20% unless otherwise specified belo	ow? Yes []	No N/A	Comme	ents:	

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ACTIO	ON: If the RPD is greater than	specified limits, qualify all results for that	analyte as estimated (J)					
	pH* □ = 3%	Specific Conductivity $*\Box = 5\%$	TSS** □ = 6%		Т	DS** □ = 6%	,	
8.0	Sampling Accuracy							
	ajority of ground water sam edicated tubing. Rinse blan	nples are collected directly from a tap aks will not be collected.	, process stream, or					
	8.1 Were rinsate blanks coll associated samples from the s	lected? Prior to evaluating rinsate blank senior chemist.	s, obtain a list of the	Yes []	No 🔝	N/A 🔝	Comments:	
	8.2 Do any rinsate blanks have	ve positive results?		Yes []	No []	N/A	Comments:	
ACTI	ON: Evaluate rinsate results	s vs. blank results to determine if conta	aminant may be labor	ratory-derive	ed. If not la	ab-related, qu	alify according to the table b	elow.
		is $< 5 \times$ blank value, flag sample result nor	•					
	If the sample concentration i	is $> 5 \times$ blank value, no qualification is need	eded.					
NOTE	: MADEP does not require to	the collection of rinsate blanks.						
9.0	Field Duplicates					/		
	9.1 Were field duplicate s field duplicates.	samples collected? Obtain a list of sample	es and their associated	Yes []	No []	N/A [_]	Comments:	
	9.2 Were field duplicates co	ollected per the required frequency?		Yes []	No []	N/A [/]	Comments:	
QA	PP/IRSWP □ MADEP OF	otion 1(1 per 20) MADEP Option	3 (1 per 10) □	-				
	9.3 Was the RPD \leq 30% for attach to this review.	waters ≤ 50% for soils? Calculate the I	RPD for results and	Yes []	No [_]	N/A [_]	Comments:	

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ACTION:. Qualify data (J) for both sample results if the RPD exceeded.	
Was any of the data qualified? Yes [_]	No N/A Comments:
If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.	
EFERENCES:-	
AACTEC, 2007. "Draft Interim Response Steps Work Plan"; Olin Chemical Superfund Site, 51 Eames Street, 5, 2007.	Wilmington, Massachusetts.; Project No. 6300-06-0010/41.1; July
Massachusetts Department of Environmental Protection (MADEP), 2004. "The Compendium of Quality Assurator Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan Massachusetts 02108; WSC-CAM; May 2004.	nce and Quality Control Requirements and Performance Standard (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston



FILE COPY

ANALYTICAL REPORT

OF PARAMETERS ORDERED BY:

10/8/10

Job Number: 360-29918-1

Job Description: Olin Chemical Groundwater

For:
Olin Corporation
3855 North Ocoee Street
Suite 200
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Attention: Mr. Steven Morrow

Danne Den

Approved for release. James T Wickham Technology Manager 9/22/2010 1:52 PM

Designee for
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09/22/2010

Results relate only to the items tested and the sample(s) as received by the laboratory. The test results in this report meet all NELAC requirements for accredited parameters, exceptions are noted in this report. Pursuant to NELAC, this report may not be reproduced except in full, and with written approval from the laboratory. TestAmerica Westfield Certifications and Approvals: MADEP MA014, RIDOH57, CTDPH 0494, VT DECWSD, NH DES 2539, NELAP FL E87912 TOX, NELAP NJ MA008 TOX, NELAP NY 10843, NY ELAP 10843, North Carolina 647, NELAP PA 68-04386. Field sampling is performed under SOPs WE-FLD-001 and WE-FLD-002.



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	MassDEP Analytical Protocol Certification Form									
Labor	_aboratory Name: TestAmerica Westfield Project #: 360-29918-1									
Proje	Project Location: Olin Chemical Groundwater RTN:									
This f	This form provides certifications for the following data set: list Laboratory Sample ID Number(s)):									
	60-29918-[1-9]									
Matric	es: X	Groundwater/Surfa	ce Water	Soil/Sediment	Drinking Water	other:				
	AM Protocols (check all that apply below):									
8260	_	7470/7471 Hg	Mass DEP VPH	8081 Pesticides	7196 Hex Cr	Mass DEP APH				
CAM 8270 :	SVOC	CAM III B	Mass DEP EPH	CAM V B 4 8151 Herbicides	CAM VI B 8330 Explosives	CAM IX A L				
CAM		CAM III C	CAM IV B	CAM V C	CAM VIII A	CAM IX B				
	Metals	6020 Metals	8082 PCB CAM V A	9014 Total Cyanide/PAC CAM VI A	332.0 Perchlorate CAM VIII B					
	Affirmative	Responses to Que	stions A through I	F are required for "	Presumptive Certainty" st	atus				
Α		served (including ter			ed on the Chain-of-Custody, d prepared/analyzed within	X Yes No				
В	Were the applytical method(s) and all appointed OC requirements appointed in the collected CAM									
С				esponse actions spece standard non-cor	ecified in the selected CAM nformances?	XYes No				
D			•		pecified in CAM VII A, and Reporting of Analytical	X Yes No				
E	modification((s)? (Refer to the inc	dividual method(s) f	ethod conducted witl or a list of significan e analyte list reporte	<u> </u>	Yes No				
F	evaluated in	a laboratory narrativ	ve (including all "No	" responses to Que	onformances identified and stions A through E)?	XYes No				
	Respons	ses to Questions G	6, H and I below ar	e required for "Pre	sumptive Certainty" statu	5				
G	protocol(s)?		·		n the selected CAM	X Yes No1				
			•	" status may not ned 1056 (2)(k) and WCS	cessarily meet the data usabi 3-07-350	lity and				
Н	Were all QC	performance stand	ards specified in the	e CAM protocol(s) a	chieved?	X Yes No				
ı	Were results	reported for the co	mplete analyte list s	specified in the selec	cted CAM protocol(s) ?	Yes X No				
¹ All n										
obtain	All negative responses must be addressed in an attached laboratory narrative. I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.									
Signa	ture:	State	ortuna	Position:	Laboratory D	Director				
Printe	rinted Name: Steven C. Hartmann Date: 9/22/10 12:54									

CASE NARRATIVE

Client: Olin Corporation

Project: Olin Chemical Groundwater

Report Number: 360-29918-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 09/01/2010; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 3.0, 9.0 C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2 C of the required temperature or method specified range. For samples with a specified temperature of 4 C, samples with a temperature ranging from just above freezing temperature of water to 6 C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

DISSOLVED METALS

Samples OC-GW 79S (360-29918-1), OC-GW 202D (360-29918-2), OC-GW 202S (360-29918-3), OC-GW 202S DUP (360-29918-4), OC-PZ 18R (360-29918-5), OC-PZ 16RR (360-29918-6), OC-PZ 17RR (360-29918-7), OC-GW 78S (360-29918-8) and OC-GW 25 (360-29918-9) were analyzed for dissolved metals in accordance with EPA SW-846 Method 6010B. The samples were analyzed on 09/08/2010.

General method information:

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No difficulties were encountered during the dissolved metals analyses.

All quality control parameters were within the acceptance limits.

SPECIFIC CONDUCTIVITY

Samples OC-GW 79S (360-29918-1), OC-GW 202D (360-29918-2), OC-GW 202S (360-29918-3), OC-GW 202S DUP (360-29918-4), OC-PZ 18R (360-29918-5), OC-PZ 16RR (360-29918-6), OC-PZ 17RR (360-29918-7), OC-GW 78S (360-29918-8) and OC-GW 25 (360-29918-9) were analyzed for specific conductivity in accordance with SM20 2510B. The samples were analyzed on 09/08/2010.

General method information:

Samples OC-GW 79S (360-29918-1)[10X], OC-GW 202D (360-29918-2)[10X] and OC-PZ 16RR (360-29918-6)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the conductivity analyses.

All quality control parameters were within the acceptance limits.

ANIONS

Samples OC-GW 79S (360-29918-1), OC-GW 202D (360-29918-2), OC-GW 202S (360-29918-3), OC-GW 202S DUP (360-29918-4), OC-PZ 18R (360-29918-5), OC-PZ 16RR (360-29918-6), OC-PZ 17RR (360-29918-7), OC-GW 78S (360-29918-8) and OC-GW 25 (360-29918-9) were analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 09/08/2010, 09/09/2010 and 09/16/2010.

General method information:

Samples OC-GW 79S (360-29918-1)[10X], OC-GW 202D (360-29918-2)[10X], OC-GW 202D (360-29918-2)[20X], OC-GW 202S (360-29918-3)[10X], OC-GW 202S DUP (360-29918-4)[10X], OC-PZ 18R (360-29918-5)[10X], OC-PZ 16RR (360-29918-6)[10X], OC-PZ 17RR (360-29918-7)[10X], OC-GW 78S (360-29918-8)[10X] and OC-GW 25 (360-29918-9)[10X] required dilution prior to analysis. The

reporting limits have been adjusted accordingly.

No difficulties were encountered during the anions analyses.

All quality control parameters were within the acceptance limits.

<u>AMMONIA</u>

Samples OC-GW 79S (360-29918-1), OC-GW 202D (360-29918-2), OC-GW 202S (360-29918-3), OC-GW 202S DUP (360-29918-4), OC-PZ 18R (360-29918-5), OC-PZ 16RR (360-29918-6), OC-PZ 17RR (360-29918-7), OC-GW 78S (360-29918-8) and OC-GW 25 (360-29918-9) were analyzed for ammonia in accordance with Lachat 107-06-1B. The samples were prepared on 09/02/2010 and 09/03/2010 and 09/03/2010 and 09/03/2010.

Ammonia failed the recovery criteria low for the MS/MSD of sample OC-PZ 17RRMS (360-29918-7) in batch 360-62812. The presence of the '4' qualifier in the report indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount. Refer to the QC report for details.

General method information:

Samples OC-GW 79S (360-29918-1)[10X], OC-GW 202D (360-29918-2)[50X], OC-GW 202S (360-29918-3)[10X], OC-GW 202S DUP (360-29918-4)[10X], OC-PZ 18R (360-29918-5)[10X], OC-PZ 16RR (360-29918-6)[10X], OC-PZ 17RR (360-29918-7)[10X], OC-GW 78S (360-29918-8)[10X] and OC-GW 25 (360-29918-9)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No other difficulties were encountered during the ammonia analyses.

All other quality control parameters were within the acceptance limits.

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation Job Number: 360-29918-1

Lab Sample ID Cl Analyte	lient Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-29918-1	OC-GW 79S				
Sulfate		830	20	mg/L	300.0
Chloride		200	10	mg/L	300.0
Ammonia		120	1.0	mg/L	L107-06-1B
Specific Conductance		2700	10	umhos/cm	SM 2510B
Dissolved					
Chromium		23	5.0	ug/L	6010B
360-29918-2	OC-GW 202D				
Sulfate		1900	40	mg/L	300.0
Chloride		230	10	mg/L	300.0
Ammonia		240	5.0	mg/L	L107-06-1B
Specific Conductance		4700	10	umhos/cm	SM 2510B
Dissolved					
Aluminum		13000	100	ug/L	6010B
Chromium		1000	5.0	ug/L	6010B
360-29918-3	OC-GW 202S				
Sulfate		490	20	mg/L	300.0
Chloride		65	10	mg/L	300.0
Ammonia		70	1.0	mg/L	L107-06-1B
Specific Conductance		1300	1.0	umhos/cm	SM 2510B
Dissolved					
Chromium		5.3	5.0	ug/L	6010B
360-29918-4	OC-GW 202S DUP				
Sulfate		490	20	mg/L	300.0
Chloride		66	10	mg/L	300.0
Ammonia		62	1.0	mg/L	L107-06-1B
Specific Conductance		1300	1.0	umhos/cm	SM 2510B
Dissolved					
Chromium		5.7	5.0	ug/L	6010B

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation Job Number: 360-29918-1

Lab Sample ID Cl Analyte	lient Sample ID	Result / Q	ualifier	Reporting Limit	Units	Method
360-29918-5	OC-PZ 18R					
Sulfate		170		20	mg/L	300.0
Chloride		190		10	mg/L	300.0
Ammonia		52		1.0	mg/L	L107-06-1B
Specific Conductance		1200		1.0	umhos/cm	SM 2510B
Dissolved						
Chromium		12		5.0	ug/L	6010B
360-29918-6	OC-PZ 16RR					
Sulfate		520		20	mg/L	300.0
Chloride		250		10	mg/L	300.0
Ammonia		100		1.0	mg/L	L107-06-1B
Specific Conductance		2300		10	umhos/cm	SM 2510B
Dissolved						
Chromium		2.1	J	5.0	ug/L	6010B
360-29918-7	OC-PZ 17RR					
Sulfate		510		20	mg/L	300.0
Chloride		20		10	mg/L	300.0
Ammonia		59		1.0	mg/L	L107-06-1B
Specific Conductance		1300		1.0	umhos/cm	SM 2510B
Dissolved						
Chromium		4.4	J	5.0	ug/L	6010B
360-29918-8	OC-GW 78S					
Sulfate		590		20	mg/L	300.0
Chloride		24		10	mg/L	300.0
Ammonia		41		1.0	mg/L	L107-06-1B
Specific Conductance		1300		1.0	umhos/cm	SM 2510B
Dissolved						
Chromium		2.5	J	5.0	ug/L	6010B

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation Job Number: 360-29918-1

Lab Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-29918-9 OC-GW 25				
Sulfate	100	20	mg/L	300.0
Chloride	100	10	mg/L	300.0
Ammonia	44	0.50	mg/L	L107-06-1B
Specific Conductance	720	1.0	umhos/cm	SM 2510B
Dissolved				
Chromium	2.5 J	5.0	ug/L	6010B

METHOD SUMMARY

Client: Olin Corporation Job Number: 360-29918-1

Description	Lab Location	Method Preparation Method
Matrix: Water		
Dissolved Metals Sample Filtration, Field	TAL WFD TAL WFD	SW846 6010B FIELD_FLTRD
Chloride & Sulfate	TAL WFD	40CFR136A 300.0
Nitrogen Ammonia Distillation, Ammonia	TAL WFD TAL WFD	LACHAT L107-06-1B Distill/Ammonia
Conductivity, Specific Conductance	TAL WFD	SM SM 2510B

Lab References:

TAL WFD = TestAmerica Westfield

Method References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

LACHAT = LACHAT

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Olin Corporation Job Number: 360-29918-1

Method	Analyst	Analyst ID
SW846 6010B	Smith, Tim J	TJS
40CFR136A 300.0 40CFR136A 300.0	Emerich, Rich W Hartmann, Steve	RWE SH
40CFR136A 300.0 LACHAT L107-06-1B	Smith, Tim J Emerich, Rich W	TJS RWE
SM SM 2510B SM SM 2510B	Emerich, Rich W Stewart, Alyse M	RWE AMS

SAMPLE SUMMARY

Client: Olin Corporation Job Number: 360-29918-1

			Date/Time	Date/Time
Lab Sample ID	Client Sample ID	Client Matrix	Sampled	Received
360-29918-1	OC-GW 79S	Water	08/30/2010 1335	09/01/2010 1700
360-29918-2	OC-GW 202D	Water	08/31/2010 0905	09/01/2010 1700
360-29918-3	OC-GW 202S	Water	08/31/2010 0955	09/01/2010 1700
360-29918-4	OC-GW 202S DUP	Water	08/31/2010 1000	09/01/2010 1700
360-29918-5	OC-PZ 18R	Water	08/31/2010 1130	09/01/2010 1700
360-29918-6	OC-PZ 16RR	Water	08/31/2010 1325	09/01/2010 1700
360-29918-7	OC-PZ 17RR	Water	09/01/2010 1000	09/01/2010 1700
360-29918-8	OC-GW 78S	Water	09/01/2010 1135	09/01/2010 1700
360-29918-9	OC-GW 25	Water	09/01/2010 0845	09/01/2010 1700

SAMPLE RESULTS

Client: Olin Corporation Job Number: 360-29918-1

Client Sample ID: OC-GW 79S

Lab Sample ID: 360-29918-1 Date Sampled: 08/30/2010 1335

Client Matrix: Water Date Received: 09/01/2010 1700

6010B Dissolved Metals-Dissolved

Method:6010BAnalysis Batch: 360-62896Instrument ID:Varian ICPPreparation:N/ALab File ID:090810a.csv

Dilution: 1.0 Lab File ID: 0908 T03.CSV

Date Analyzed: 09/08/2010 1128 Final Weight/Volume: 1.0 mL

Date Prepared:

 Analyte
 Result (ug/L)
 Qualifier
 MDL
 RL

 Aluminum
 ND
 15
 100

 Chromium
 23
 1.0
 5.0

Client: Olin Corporation Job Number: 360-29918-1

Client Sample ID: OC-GW 202D

Lab Sample ID: 360-29918-2 Date Sampled: 08/31/2010 0905

Client Matrix: Water Date Received: 09/01/2010 1700

6010B Dissolved Metals-Dissolved

Method: 6010B Analysis Batch: 360-62896 Instrument ID: Varian ICP

Preparation: N/A Lab File ID: 090810a.csv Dilution: 1.0 Lab File ID: 090810a.csv

Date Analyzed: 09/08/2010 1139 Final Weight/Volume: 1.0 mL

Date Prepared:

 Analyte
 Result (ug/L)
 Qualifier
 MDL
 RL

 Aluminum
 13000
 15
 100

 Chromium
 1000
 1.0
 5.0

Client: Olin Corporation Job Number: 360-29918-1

Client Sample ID: OC-GW 202S

Lab Sample ID: 360-29918-3 Date Sampled: 08/31/2010 0955

Client Matrix: Water Date Received: 09/01/2010 1700

6010B Dissolved Metals-Dissolved

Method:6010BAnalysis Batch: 360-62896Instrument ID:Varian ICPPreparation:N/ALab File ID:090810a.csv

Dilution: 1.0 Initial Weight/Volume:

Date Analyzed: 09/08/2010 1149 Final Weight/Volume: 1.0 mL

Date Prepared:

 Analyte
 Result (ug/L)
 Qualifier
 MDL
 RL

 Aluminum
 ND
 15
 100

 Chromium
 5.3
 1.0
 5.0

Client: Olin Corporation Job Number: 360-29918-1

Client Sample ID: OC-GW 202S DUP

Lab Sample ID: 360-29918-4 Date Sampled: 08/31/2010 1000

Client Matrix: Water Date Received: 09/01/2010 1700

6010B Dissolved Metals-Dissolved

Method:6010BAnalysis Batch: 360-62896Instrument ID:Varian ICPPreparation:N/ALab File ID:090810a.csv

Dilution: 1.0 Initial Weight/Volume:

Date Analyzed: 09/08/2010 1152 Final Weight/Volume: 1.0 mL

Date Prepared:

 Analyte
 Result (ug/L)
 Qualifier
 MDL
 RL

 Aluminum
 ND
 15
 100

 Chromium
 5.7
 1.0
 5.0

Client: Olin Corporation Job Number: 360-29918-1

Client Sample ID: OC-PZ 18R

Lab Sample ID: 360-29918-5 Date Sampled: 08/31/2010 1130

Client Matrix: Water Date Received: 09/01/2010 1700

6010B Dissolved Metals-Dissolved

Method:6010BAnalysis Batch: 360-62896Instrument ID:Varian ICPPreparation:N/ALab File ID:090810a.csv

Dilution: 1.0 Initial Weight/Volume:

Date Analyzed: 09/08/2010 1155 Final Weight/Volume: 1.0 mL

Date Prepared:

 Analyte
 Result (ug/L)
 Qualifier
 MDL
 RL

 Aluminum
 ND
 15
 100

 Chromium
 12
 1.0
 5.0

Client: Olin Corporation Job Number: 360-29918-1

Client Sample ID: OC-PZ 16RR

Lab Sample ID: 360-29918-6 Date Sampled: 08/31/2010 1325

Client Matrix: Water Date Received: 09/01/2010 1700

6010B Dissolved Metals-Dissolved

Method:6010BAnalysis Batch: 360-62896Instrument ID:Varian ICPPreparation:N/ALab File ID:090810a.csv

Dilution: 1.0 Lab File ID: 0906 Toa.cs

Initial Weight/Volume:

Date Analyzed: 09/08/2010 1157 Final Weight/Volume: 1.0 mL

Date Prepared:

 Analyte
 Result (ug/L)
 Qualifier
 MDL
 RL

 Aluminum
 ND
 15
 100

 Chromium
 2.1
 J
 1.0
 5.0

Client: Olin Corporation Job Number: 360-29918-1

Client Sample ID: OC-PZ 17RR

Lab Sample ID: 360-29918-7 Date Sampled: 09/01/2010 1000

Client Matrix: Water Date Received: 09/01/2010 1700

6010B Dissolved Metals-Dissolved

Method:6010BAnalysis Batch: 360-62896Instrument ID:Varian ICPPreparation:N/ALab File ID:090810a.csv

Dilution: 1.0 Initial Weight/Volume:

Date Analyzed: 09/08/2010 1200 Final Weight/Volume: 1.0 mL

Date Prepared:

 Analyte
 Result (ug/L)
 Qualifier
 MDL
 RL

 Aluminum
 ND
 15
 100

 Chromium
 4.4
 J
 1.0
 5.0

Client: Olin Corporation Job Number: 360-29918-1

Client Sample ID: OC-GW 78S

Lab Sample ID: 360-29918-8 Date Sampled: 09/01/2010 1135

Client Matrix: Water Date Received: 09/01/2010 1700

6010B Dissolved Metals-Dissolved

Method:6010BAnalysis Batch: 360-62896Instrument ID:Varian ICPPreparation:N/ALab File ID:090810a.csv

Dilution: 1.0 Initial Weight/Volume:

Date Analyzed: 09/08/2010 1203 Final Weight/Volume: 1.0 mL

Date Prepared:

 Analyte
 Result (ug/L)
 Qualifier
 MDL
 RL

 Aluminum
 ND
 15
 100

 Chromium
 2.5
 J
 1.0
 5.0

Client: Olin Corporation Job Number: 360-29918-1

Client Sample ID: OC-GW 25

Lab Sample ID: 360-29918-9 Date Sampled: 09/01/2010 0845

Client Matrix: Water Date Received: 09/01/2010 1700

6010B Dissolved Metals-Dissolved

Method:6010BAnalysis Batch: 360-62896Instrument ID:Varian ICPPreparation:N/ALab File ID:090810a.csv

Dilution: 1.0 Initial Weight/Volume:

Date Analyzed: 09/08/2010 1206 Final Weight/Volume: 1.0 mL

Date Prepared:

 Analyte
 Result (ug/L)
 Qualifier
 MDL
 RL

 Aluminum
 ND
 15
 100

 Chromium
 2.5
 J
 1.0
 5.0

Client: Olin Corporation Job Number: 360-29918-1

General Chemistry

Client Sample ID: OC-GW 79S

Lab Sample ID: 360-29918-1 Date Sampled: 08/30/2010 1335

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Sulfate	830		mg/L	20	20	10	300.0
	Analysis Batch: 360-63181	Date Analyzed	: 09/08/2010 2	2104			
Chloride	200		mg/L	10	10	10	300.0
	Analysis Batch: 360-63181	Date Analyzed	: 09/08/2010 2	2104			
Ammonia	120		mg/L	1.0	1.0	10	L107-06-1B
	Analysis Batch: 360-62809	Date Analyzed	: 09/03/2010	1447			
	Prep Batch: 360-62759	Date Prep	pared: 09/02/2	010 1500			
Specific Conductano	ce 2700		umhos/cm	10	10	10	SM 2510B

Client: Olin Corporation Job Number: 360-29918-1

General Chemistry

Client Sample ID: OC-GW 202D

Lab Sample ID: 360-29918-2 Date Sampled: 08/31/2010 0905 Client Matrix: Water

Date Received: 09/01/2010 1700

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Sulfate	1900		mg/L	40	40	20	300.0
	Analysis Batch: 360-63326	Date Analyzed	: 09/16/201	0 2259			
Chloride	230		mg/L	10	10	10	300.0
	Analysis Batch: 360-63181	Date Analyzed	: 09/08/201	0 2120			
Ammonia	240		mg/L	5.0	5.0	50	L107-06-1B
	Analysis Batch: 360-63048	Date Analyzed	: 09/09/201	0 1403			
	Prep Batch: 360-62759	Date Prep	oared: 09/02	2/2010 1500			
Specific Conductan	ce 4700		umhos/cr	n 10	10	10	SM 2510B
	Analysis Batch: 360-62942	Date Analyzed	: 09/08/201	0 1707			

Client: Olin Corporation Job Number: 360-29918-1

General Chemistry

Client Sample ID: OC-GW 202S Lab Sample ID: 360-29918-3 Date Sampled: 08/31/2010 0955 Client Matrix: Water Date Received: 09/01/2010 1700 Analyte Result Qual Units RL RL Dil Method Sulfate 490 mg/L 20 20 10 300.0

Analyte	Resu	lt Qual	Units	RL	RL	Dil	Method
Sulfate	490		mg/L	20	20	10	300.0
	Analysis Batch: 360-63190	Date Analyzed	I: 09/08/20 ⁻	10 2235			
Chloride	65		mg/L	10	10	10	300.0
	Analysis Batch: 360-63190	Date Analyzed	I: 09/08/20 ⁻	10 2235			
Ammonia	70		mg/L	1.0	1.0	10	L107-06-1B
	Analysis Batch: 360-62809	Date Analyzed	I: 09/03/20 ⁻	10 1449			
	Prep Batch: 360-62759	Date Prep	oared: 09/0	2/2010 1500			
Specific Conductar	nce 1300		umhos/c	m 1.0	1.0	1.0	SM 2510B
	Analysis Batch: 360-62904	Date Analyzed	I: 09/08/20 ⁻	10 1517			

Client: Olin Corporation Job Number: 360-29918-1

General Chemistry Client Sample ID: **OC-GW 202S DUP** Lab Sample ID: 360-29918-4 Date Sampled: 08/31/2010 1000 Client Matrix: Water Date Received: 09/01/2010 1700 Analyte RLDil Method Result Qual Units RL Sulfate 490 mg/L 20 20 10 300.0 Analysis Batch: 360-63190 Date Analyzed: 09/08/2010 2250 Chloride 66 mg/L 10 10 10 300.0 Analysis Batch: 360-63190 Date Analyzed: 09/08/2010 2250 Ammonia mg/L 1.0 10 L107-06-1B Analysis Batch: 360-62809 Date Analyzed: 09/03/2010 1450 Prep Batch: 360-62759 Date Prepared: 09/02/2010 1500 Specific Conductance umhos/cm 1.0 1.0 SM 2510B

Date Analyzed: 09/08/2010 1521

Analysis Batch: 360-62904

Client: Olin Corporation Job Number: 360-29918-1

General Chemistry

Client Sample ID: OC-PZ 18R

Lab Sample ID: 360-29918-5 Date Sampled: 08/31/2010 1130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Sulfate	170		mg/L	20	20	10	300.0
	Analysis Batch: 360-63190	Date Analyzed	: 09/08/2010 2	2305			
Chloride	190		mg/L	10	10	10	300.0
	Analysis Batch: 360-63190	Date Analyzed	: 09/08/2010 2	2305			
Ammonia	52		mg/L	1.0	1.0	10	L107-06-1B
	Analysis Batch: 360-62809	Date Analyzed	: 09/03/2010	1451			
	Prep Batch: 360-62759	Date Prep	oared: 09/02/2	010 1500			
Specific Conductano	ce 1200		umhos/cm	1.0	1.0	1.0	SM 2510B

Client: Olin Corporation Job Number: 360-29918-1

General Chemistry

Client Sample ID: OC-PZ 16RR

Lab Sample ID: 360-29918-6 Date Sampled: 08/31/2010 1325

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Sulfate	520		mg/L	20	20	10	300.0
	Analysis Batch: 360-63190	Date Analyzed	: 09/08/2010	2320			
Chloride	250		mg/L	10	10	10	300.0
	Analysis Batch: 360-63190	Date Analyzed	: 09/08/2010	2320			
Ammonia	100		mg/L	1.0	1.0	10	L107-06-1B
	Analysis Batch: 360-62809	Date Analyzed	: 09/03/2010	1454			
	Prep Batch: 360-62759	Date Prep	oared: 09/02/2	2010 1500			
Specific Conductano	ce 2300		umhos/cm	10	10	10	SM 2510B

Client: Olin Corporation Job Number: 360-29918-1

General Chemistry

Client Sample ID: OC-PZ 17RR

Lab Sample ID: 360-29918-7 Date Sampled: 09/01/2010 1000

Analyte		Result	Qual	Units	RL	RL	Dil	Method
Sulfate		510		mg/L	20	20	10	300.0
	Analysis Batch: 360-63	190	Date Analyzed	: 09/08/201	0 2335			
Chloride		20		mg/L	10	10	10	300.0
	Analysis Batch: 360-63	190	Date Analyzed	: 09/08/201	0 2335			
Ammonia		59		mg/L	1.0	1.0	10	L107-06-1B
	Analysis Batch: 360-628	812	Date Analyzed	: 09/03/201	0 1459			
	Prep Batch: 360-62	2783	Date Prep	ared: 09/03	3/2010 1039			
Specific Conductano	ce	1300		umhos/cr	n 1.0	1.0	1.0	SM 2510B
	Analysis Batch: 360-629	904	Date Analyzed	: 09/08/201	0 1526			

Client: Olin Corporation Job Number: 360-29918-1

General Chemistry

Client Sample ID: OC-GW 78S

Lab Sample ID: 360-29918-8 Date Sampled: 09/01/2010 1135

Analyte		Result	Qual	Units	RL	RL	Dil	Method
Sulfate		590		mg/L	20	20	10	300.0
,	Analysis Batch: 360-63	190	Date Analyzed:	09/08/201	10 2351			
Chloride		24		mg/L	10	10	10	300.0
,	Analysis Batch: 360-63	190	Date Analyzed:	09/08/201	10 2351			
Ammonia		41		mg/L	1.0	1.0	10	L107-06-1B
,	Analysis Batch: 360-62	812	Date Analyzed:	09/03/201	10 1502			
	Prep Batch: 360-6	2783	Date Prep	ared: 09/0	3/2010 1039			
Specific Conductano	e	1300		umhos/ci	m 1.0	1.0	1.0	SM 2510B
,	Analysis Batch: 360-62	904	Date Analyzed:	09/08/201	10 1527			

Client: Olin Corporation Job Number: 360-29918-1

General Chemistry

Client Sample ID: OC-GW 25

Lab Sample ID: 360-29918-9 Date Sampled: 09/01/2010 0845

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Sulfate	100	Quai	mg/L	20	20	10	300.0
Д	analysis Batch: 360-63190	Date Analyzed	J	0006			
Chloride	100	-	mg/L	10	10	10	300.0
A	nalysis Batch: 360-63190	Date Analyzed	: 09/09/2010	0006			
Ammonia	44		mg/L	0.50	0.50	5.0	L107-06-1B
A	nalysis Batch: 360-63430	Date Analyzed	: 09/21/2010	1438			
	Prep Batch: 360-62783	Date Prep	pared: 09/03/2	2010 1039			
Specific Conductance	e 720		umhos/cm	1.0	1.0	1.0	SM 2510B
Δ	nalysis Batch: 360-62904	Date Analyzed	. 09/08/2010	1529			

DATA REPORTING QUALIFIERS

Client: Olin Corporation Job Number: 360-29918-1

Lab Section	Qualifier	Description
Metals		
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
General Chemistry		
	4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.

QUALITY CONTROL RESULTS

Client: Olin Corporation Job Number: 360-29918-1

QC Association Summary

		Report			
Lab Sample ID	Client Sample ID	Basis	Client Matrix	Method	Prep Batch
Metals					
Analysis Batch:360-6289	96				
LCS 360-62896/13	Lab Control Sample	Т	Water	6010B	
LCSD 360-62896/26	Lab Control Sample Duplicate	Т	Water	6010B	
MB 360-62896/14	Method Blank	Т	Water	6010B	
360-29918-1	OC-GW 79S	D	Water	6010B	
360-29918-1DU	Duplicate	D	Water	6010B	
360-29918-1MS	Matrix Spike	D	Water	6010B	
360-29918-1SD	Serial Dilution	D	Water	6010B	
360-29918-2	OC-GW 202D	D	Water	6010B	
360-29918-3	OC-GW 202S	D	Water	6010B	
360-29918-4	OC-GW 202S DUP	D	Water	6010B	
360-29918-5	OC-PZ 18R	D	Water	6010B	
360-29918-6	OC-PZ 16RR	D	Water	6010B	
360-29918-7	OC-PZ 17RR	D	Water	6010B	
360-29918-8	OC-GW 78S	D	Water	6010B	
360-29918-9	OC-GW 25	D	Water	6010B	

Report Basis

D = Dissolved

T = Total

Client: Olin Corporation Job Number: 360-29918-1

QC Association Summary

		Report			
Lab Sample ID	Client Sample ID	Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Prep Batch: 360-62759					
LCS 360-62759/2-A	Lab Control Sample	Т	Water	Distill/Ammonia	
MB 360-62759/1-A	Method Blank	Т	Water	Distill/Ammonia	
360-29918-1	OC-GW 79S	Т	Water	Distill/Ammonia	
360-29918-2	OC-GW 202D	T	Water	Distill/Ammonia	
360-29918-3	OC-GW 202S	Т	Water	Distill/Ammonia	
360-29918-4	OC-GW 202S DUP	T	Water	Distill/Ammonia	
360-29918-5	OC-PZ 18R	T	Water	Distill/Ammonia	
360-29918-6	OC-PZ 16RR	Т	Water	Distill/Ammonia	
Prep Batch: 360-62783					
LCS 360-62783/2-A	Lab Control Sample	Т	Water	Distill/Ammonia	
MB 360-62783/1-A	Method Blank	Т	Water	Distill/Ammonia	
360-29918-7	OC-PZ 17RR	Т	Water	Distill/Ammonia	
360-29918-7MS	Matrix Spike	Т	Water	Distill/Ammonia	
360-29918-7MSD	Matrix Spike Duplicate	Т	Water	Distill/Ammonia	
360-29918-8	OC-GW 78S	T	Water	Distill/Ammonia	
360-29918-9	OC-GW 25	Т	Water	Distill/Ammonia	
Analysis Batch:360-628	09				
LCS 360-62759/2-A	Lab Control Sample	Т	Water	L107-06-1B	360-62759
MB 360-62759/1-A	Method Blank	Т	Water	L107-06-1B	360-62759
360-29918-1	OC-GW 79S	Т	Water	L107-06-1B	360-62759
360-29918-3	OC-GW 202S	Т	Water	L107-06-1B	360-62759
360-29918-4	OC-GW 202S DUP	Т	Water	L107-06-1B	360-62759
360-29918-5	OC-PZ 18R	Т	Water	L107-06-1B	360-62759
360-29918-6	OC-PZ 16RR	Т	Water	L107-06-1B	360-62759
Analysis Batch:360-628	12				
LCS 360-62783/2-A	Lab Control Sample	Т	Water	L107-06-1B	360-62783
MB 360-62783/1-A	Method Blank	T	Water	L107-06-1B	360-62783
360-29918-7	OC-PZ 17RR	T	Water	L107-06-1B	360-62783
360-29918-7MS	Matrix Spike	T	Water	L107-06-1B	360-62783
360-29918-7MSD	Matrix Spike Duplicate	T	Water	L107-06-1B	360-62783
360-29918-8	OC-GW 78S	T	Water	L107-06-1B	360-62783
Analysis Batch:360-629	04				
LCS 360-62904/1	Lab Control Sample	Т	Water	SM 2510B	
MB 360-62904/4	Method Blank	Ť	Water	SM 2510B	
360-29918-3	OC-GW 202S	Ť	Water	SM 2510B	
360-29918-4	OC-GW 202S DUP	Ť	Water	SM 2510B	
360-29918-5	OC-PZ 18R	Ť	Water	SM 2510B SM 2510B	
360-29918-7	OC-PZ 17RR	, T	Water	SM 2510B	
360-29918-8	OC-GW 78S	, T	Water	SM 2510B SM 2510B	
360-29918-9	OC-GW 25	, T	Water	SM 2510B	
000-23310-3	00-0vv 23	ı	VValci	3W 23 10D	

Client: Olin Corporation Job Number: 360-29918-1

QC Association Summary

Lab Cample ID	Client Commis ID	Report Basis	Client Metrix	Mathad	Dran Batab
Lab Sample ID	Client Sample ID	Dasis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:360-62942					
LCS 360-62942/3	Lab Control Sample	Т	Water	SM 2510B	
MB 360-62942/2	Method Blank	Т	Water	SM 2510B	
360-29918-1	OC-GW 79S	Т	Water	SM 2510B	
360-29918-2	OC-GW 202D	Т	Water	SM 2510B	
360-29918-6	OC-PZ 16RR	Т	Water	SM 2510B	
Analysis Batch:360-63048					
360-29918-2	OC-GW 202D	Т	Water	L107-06-1B	360-62759
Analysis Batch:360-63181					
LCS 360-63181/4	Lab Control Sample	Т	Water	300.0	
MB 360-63181/3	Method Blank	Т	Water	300.0	
360-29918-1	OC-GW 79S	Т	Water	300.0	
360-29918-2	OC-GW 202D	Т	Water	300.0	
Analysis Batch:360-63190					
LCS 360-63190/4	Lab Control Sample	T	Water	300.0	
MB 360-63190/3	Method Blank	Т	Water	300.0	
360-29918-3	OC-GW 202S	Т	Water	300.0	
360-29918-4	OC-GW 202S DUP	Т	Water	300.0	
360-29918-5	OC-PZ 18R	Т	Water	300.0	
360-29918-6	OC-PZ 16RR	Т	Water	300.0	
360-29918-7	OC-PZ 17RR	Т	Water	300.0	
360-29918-8	OC-GW 78S	Т	Water	300.0	
360-29918-9	OC-GW 25	Т	Water	300.0	
Analysis Batch:360-63326					
LCS 360-63326/4	Lab Control Sample	Т	Water	300.0	
MB 360-63326/3	Method Blank	Т	Water	300.0	
360-29918-2	OC-GW 202D	Т	Water	300.0	
Analysis Batch:360-63430					
360-29918-9	OC-GW 25	Т	Water	L107-06-1B	360-62783

Report Basis

T = Total

Client: Olin Corporation

Job Number: 360-29918-1

Method Blank - Batch: 360-62896

Method: 6010B Preparation: N/A

Lab Sample ID: MB 360-62896/14

Analysis Batch: 360-62896

Instrument ID: Varian ICP

Client Matrix: Dilution:

Water 1.0

Prep Batch: N/A Units: ug/L

Lab File ID: 090810a.csv

Date Analyzed:

09/08/2010 1052

Initial Weight/Volume:

Final Weight/Volume: 1.0 mL

Date Prepared:

Analyte	Result	Qual	MDL	RL
Aluminum	ND _		15	100
Chromium	ND /		1.0	5.0

Lab Control Sample/

Lab Control Sample Duplicate Recovery Report - Batch: 360-62896

Method: 6010B Preparation: N/A

LCS Lab Sample ID: LCS 360-62896/13

Analysis Batch: 360-62896

Instrument ID: Varian ICP

Client Matrix: Dilution:

Water

Prep Batch: N/A

090810a.csv Lab File ID:

1.0

Units: ug/L

Initial Weight/Volume:

Date Analyzed:

09/08/2010 1049

Final Weight/Volume:

10 mL

Date Prepared:

N/A

LCSD Lab Sample ID: LCSD 360-62896/26

Analysis Batch: 360-62896

Instrument ID:

Varian ICP

Client Matrix: Dilution:

Water

Prep Batch: N/A

Lab File ID:

090810a.csv

Units: ug/L

Initial Weight/Volume:

Date Analyzed:

09/08/2010 1142

Date Prepared:

N/A

Final Weight/Volume: 10 mL

	2	6 Rec.		1222	12.2020.000	7712172	1012220120
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Aluminum	100	96	80 - 120	4	20		
Chromium	99	96	80 - 120	4	20		

Job Number: 360-29918-1 Client: Olin Corporation

Matrix Spike - Batch: 360-62896

Method: 6010B Preparation: N/A

Lab Sample ID: 360-29918-1

Client Matrix: Dilution:

Water

Date Analyzed: 09/08/2010 1131

Date Prepared: N/A Analysis Batch: 360-62896

Prep Batch: N/A

Units: ug/L

Instrument ID: Varian ICP

090810a.csv

Lab File ID:

Initial Weight/Volume:

Final Weight/Volume:

10 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	ND	5000	6040	121	75 - 125	
Chromium	23	1000	1130	110	75 - 125	

Duplicate - Batch: 360-62896

Method: 6010B Preparation: N/A

Lab Sample ID:

360-29918-1

Client Matrix: Dilution:

Water

Date Analyzed:

09/08/2010 1134

Date Prepared:

Analysis Batch: 360-62896

Prep Batch: N/A

Units: ug/L

Instrument ID: Varian ICP Lab File ID:

090810a.csv

Initial Weight/Volume:

Final Weight/Volume:

1.0 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Aluminum	ND	ND	NC	20	
Chromium	23	22.4	5	20	

Serial Dilution - Batch: 360-62896

Method: 6010B Preparation: N/A

Lab Sample ID: 360-29918-1

Client Matrix: Dilution:

Water

5.0

Date Analyzed:

09/08/2010 1137

Date Prepared:

Analysis Batch: 360-62896

Prep Batch: N/A

Units: ug/L

Instrument ID: Varian ICP

Lab File ID: 090810a.csv

Initial Weight/Volume:

Final Weight/Volume:

1.0 mL

Analyte	Sample Result/Qual	Result	%Diff	Limit	Qual
Aluminum	ND	ND	NC	10	
Chromium	23	24.4	NC 2	10	J
		4			

Client: Olin Corporation

Job Number: 360-29918-1

Method Blank - Batch: 360-63181

Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-63181/3

Client Matrix:

Water

Dilution: Date Analyzed:

Date Prepared: N/A

09/08/2010 1532

Analysis Batch: 360-63181

Prep Batch: N/A

Units: mg/L

Instrument ID: Lachat

Lab File ID:

N/A

Initial Weight/Volume: 1.0 mL

Final Weight/Volume:

1.0 mL

Analyte	Result	Qual	RL	RL
Sulfate	ND		2.0	2.0
Chloride	ND		1.0	1.0

Lab Control Sample - Batch: 360-63181

Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-63181/4

Client Matrix: Water Dilution:

1.0

Date Analyzed:

09/08/2010 1547

Date Prepared:

Analysis Batch: 360-63181

Prep Batch: N/A

Units: mg/L

Instrument ID: Lachat

N/A Lab File ID:

Initial Weight/Volume: 1.0 mL

Final Weight/Volume:

10 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate Chloride	80.0 40.0	80.8 39.4	101	85 - 115 85 - 115	

Client: Olin Corporation Job Number: 360-29918-1

Method Blank - Batch: 360-63190

Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-63190/3

Client Matrix:

Water 1.0

Dilution: Date Analyzed:

09/08/2010 2205

Date Prepared:

Analysis Batch: 360-63190

Prep Batch: N/A

Units: mg/L

Instrument ID: Lachat

Lab File ID: N/A

Initial Weight/Volume: 1.0 mL

Final Weight/Volume: 1.0 mL

Analyte Result Qual RL RL ND 2.0 2.0 Sulfate ND Chloride 1.0 1.0

Lab Control Sample - Batch: 360-63190

Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-63190/4

Client Matrix: Dilution:

Water

Date Analyzed:

09/08/2010 2220

Date Prepared:

1.0

Analysis Batch: 360-63190

Prep Batch: N/A

Units: mg/L

Instrument ID: Lachat

N/A Lab File ID:

Initial Weight/Volume: 1.0 mL

Final Weight/Volume:

10 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate Chloride	80.0 40.0	81.5 39.1	102	85 - 115 85 - 115	

Client: Olin Corporation Job Number: 360-29918-1

Method Blank - Batch: 360-63326

Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-63326/3

Client Matrix:

Water 1.0

Date Analyzed:

Dilution:

09/16/2010 1727

Date Prepared: N/A Analysis Batch: 360-63326

Prep Batch: N/A Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID:

Initial Weight/Volume: 1.0 mL Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Sulfate	ND /		2.0	2.0
Chloride	ND /		1.0	1.0

Lab Control Sample - Batch: 360-63326

Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-63326/4

Client Matrix: Dilution:

Water 1.0

Date Analyzed:

09/16/2010 1742

Date Prepared:

Analysis Batch: 360-63326

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: 1.0 mL

Final Weight/Volume: 10 mL

Analyte Spike Amount Result % Rec. Limit Qual Sulfate 80.0 80.2 85 - 115 100 Chloride 40.0 39.0 97 85 - 115

Client: Olin Corporation

Job Number: 360-29918-1

Method Blank - Batch: 360-62759

Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID: MB 360-62759/1-A

Client Matrix:

Water

Instrument ID: No Equipment Assigned

Analysis Batch: 360-62809 Prep Batch: 360-62759

Lab File ID:

Dilution:

Units: mg/L

Initial Weight/Volume:

50 mL

Date Analyzed: Date Prepared:

09/03/2010 1407 09/02/2010 1500 Final Weight/Volume:

50 mL

Analyte

Result

Qual

RL

RL

Ammonia

0.10

ND

0.10

Lab Control Sample - Batch: 360-62759

Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID: LCS 360-62759/2-A

Analysis Batch: 360-62809

Instrument ID:

No Equipment Assigned

Client Matrix:

Water

Lab File ID:

N/A

1.0

Prep Batch: 360-62759

Dilution: Date Analyzed:

09/03/2010 1408

Units: mg/L

Initial Weight/Volume: Final Weight/Volume:

50 mL 50 mL

Date Prepared:

09/02/2010 1500

Analyte

Spike Amount

Result

% Rec.

Limit

Qual

Ammonia

10.0

9.45

95

85 - 115

Client: Olin Corporation

Job Number: 360-29918-1

Method Blank - Batch: 360-62783

Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID:

MB 360-62783/1-A

Client Matrix:

Water

Instrument ID: No Equipment Assigned

1.0

Analysis Batch: 360-62812 Prep Batch: 360-62783

Lab File ID: N/A

Dilution:

Units: mg/L

Initial Weight/Volume:

50 mL

Date Analyzed: Date Prepared:

09/03/2010 1431 09/03/2010 1039 Final Weight/Volume:

50 mL

Analyte

Result

Qual

RL

RL

Ammonia

ND

0.10

0.10

Lab Control Sample - Batch: 360-62783

Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID:

LCS 360-62783/2-A

Analysis Batch: 360-62812

Instrument ID:

No Equipment Assigned

Client Matrix:

Water

Prep Batch: 360-62783

Lab File ID:

N/A

Dilution:

1.0

Units: mg/L

Initial Weight/Volume:

50 mL

Date Analyzed:

09/03/2010 1432 09/03/2010 1039 Final Weight/Volume:

50 mL

Date Prepared:

% Rec.

Limit

Ammonia

Analyte

10.0

Spike Amount

Result

Qual

9.27

85 - 115

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-62783

Method: L107-06-1B

Preparation: Distill/Ammonia

MS Lab Sample ID:

360-29918-7

Analysis Batch: 360-62812

Instrument ID:

No Equipment Assigned

Client Matrix:

Water

Prep Batch: 360-62783

Lab File ID: N/A

Dilution:

Initial Weight/Volume:

Date Analyzed: Date Prepared: 09/03/2010 1500 09/03/2010 1039 Final Weight/Volume:

50 mL 50 mL

MSD Lab Sample ID:

Client Matrix:

360-29918-7

Analysis Batch: 360-62812

Instrument ID: No Equipment Assigned

Water

Prep Batch: 360-62783

Lab File ID:

Date Analyzed:

Dilution:

10 09/03/2010 1501 Initial Weight/Volume:

Final Weight/Volume:

N/A

4

50 mL 50 mL

Date Prepared:

09/03/2010 1039

Limit

RPD

RPD Limit

MS Qual MSD Qual

Analyte

MS MSD -29 -108

% Rec.

75 - 125

15

20

4

Ammonia

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09/22/2010

Client: Olin Corporation Job Number: 360-29918-1

Method Blank - Batch: 360-62904

Method: SM 2510B Preparation: N/A

Lab Sample ID: MB 360-62904/4

Client Matrix:

Water

Dilution: Date Analyzed: 09/08/2010 1437

Date Prepared:

Analysis Batch: 360-62904

Prep Batch: N/A

Units: umhos/cm

Instrument ID: Autotitrator

Lab File ID:

10090800.TXT

Initial Weight/Volume:

Final Weight/Volume:

1.0 mL

Analyte	Result	Qual	RL	RL
Specific Conductance	ND		1.0	1.0

Lab Control Sample - Batch: 360-62904

Method: SM 2510B Preparation: N/A

Lab Sample ID:

LCS 360-62904/1

Client Matrix:

Water

Dilution:

1.0

Date Analyzed: 09/08/2010 1414

Date Prepared: N/A

Analysis Batch: 360-62904

Prep Batch: N/A

Units: umhos/cm

Instrument ID: Autotitrator Lab File ID: 10090800.TXT

Initial Weight/Volume:

Final Weight/Volume: 1.0 mL

Analyte Spike Amount Result % Rec. Limit Qual Specific Conductance 1410 1390 85 - 115 98

Quality Control Results

Client: Olin Corporation

Job Number: 360-29918-1

Method Blank - Batch: 360-62942

Method: SM 2510B Preparation: N/A

Lab Sample ID: MB 360-62942/2 Client Matrix:

Water

Dilution:

1.0

Date Analyzed:

09/08/2010 1701

Date Prepared:

Analysis Batch: 360-62942

Prep Batch: N/A

Units: umhos/cm

Instrument ID: Autotitrator

Lab File ID:

10090801.TXT

Initial Weight/Volume:

Final Weight/Volume:

1.0 mL

Analyte

Specific Conductance

Result

Qual

RL

RL

ND

1.0

1.0

Lab Control Sample - Batch: 360-62942

Method: SM 2510B

Preparation: N/A

Lab Sample ID: LCS 360-62942/3

Client Matrix:

Water

Dilution: Date Analyzed: 1.0

09/08/2010 1702

Date Prepared:

N/A

Analysis Batch: 360-62942

Prep Batch: N/A

Units: umhos/cm

Instrument ID: Autotitrator

Lab File ID: 10090801.TXT

Initial Weight/Volume:

Final Weight/Volume: 1.0 mL

Analyte

Spike Amount

Result

% Rec.

Limit

Specific Conductance

Qual

1410

1390

99

85 - 115

State Accreditation Matrix

			State where P	rimary Accreditat	ion is Carried	
Mathadalaa	Description	New Hampshire			Florida (NELAC)	North
Method Name 821-R-02-012	Description Toxicity, Acute (48-Hour)(list upon request)	(NELAC) prim.	Mass	Conn	(NELAC) NP	Carolina
SM 4500 CI F	Chlorine, Residual		NP			
SM 9215E	Heterotrophic Plate Count (SimPlate)		Р			
SM 9222D	Coliforms, Fecal (Membrane Filter)		P/NP			
SM 9223	Coliforms, Total, and E.Coli (Colilert-P/A)		Р			
SM 9224	Coliforms, Total, and E.Coli (Enumeration)		Р			
1103.1	E.coli		ambient/			
Enterolert	Enterococcus		source			
200.8 Rev 5.4	Metals (ICP/MS) (list upon request)	NP/P	NP/P	NP/P		
200.7 Rev 4.4	Metals (ICP)(list upon request)	NP/P	NP/P	NP/P		
6010B	Metals (ICP)(list upon request)	NP/SW		NP/SW		
245.1	Mercury (CVAA)	NP/P	NP	NP/P		
7470A	Mercury (CVAA)	NP		NP		
7471A	Mercury (CVAA)	SW		SW		
SM 2340B	Total Hardness (as CaCO3) by calculation	NP/P	NP	NP/P		
3005A	Preparation, Total Recoverable or Dissolved Metals	NP/P		NP/P		
3010A	Preparation, Total Metals	NP/P		NP/P		
3020A	Preparation, Total Metals	NP/P/SW		NP/P/SW		
3050B	Preparation, Metals	SW		SW		1
504.1	EDB, DBCP and 1,2,3-TCP (GC)	P	P NP	P NP		
608	Organochlorine Pest/PCBs (list upon request)	NP NP	NP	NP NP		
625 3546	Semivolatile Org Comp (GC/MS)(list upon request) Microwave Extraction	SW		INF		
3546 3510C	Liquid-Liquid Extraction (Separatory Funnel)	NP		NP		
3540C	Soxhlet Extraction	SW		INI		
3550B	Ultrasonic Extraction	SW		SW		
600/4-81-045	Polychlorinated Biphenyls (PCBs) (GC)	OVV	NP	NP		
8081A	Organochlorine Pesticides (GC)(list upon request)	NP/SW	111	NP/SW		
8082A	PCBs by Gas Chromatography(list upon request)	NP/SW		NP/SW		
8270C	Semivolatile Comp.(GC/MS)(list upon request)	NP/SW		NP/SW		
CT ETPH	Conn - Ext. Total petroleum Hydrocarbons (GC)			NP/SW		
MA-EPH	Mass - Extractable Petroleum Hydrocarbons (GC)			NP/SW		NP/SW
524.2	Volatile Org Comp (GC/MS)(list upon request)	Р	Р	Р		
524.2	Trihalomethane compounds	Р	Р	Р		
624	Volatile Org Comp (GC/MS)(list upon request)	NP	NP	NP		
5035	Closed System Purge and Trap	SW		SW		
5030B	Purge and Trap	NP		NP		
8260B	Volatile Org Comp. (GC/MS)(list upon request)	NP/SW		NP/SW		
MAVPH	Mass - Volatile Petroleum Hydrocarbons (GC)			NP/SW		NP/SW
180.1	Turbidity, Nephelometric	Р	Р	Р		
300	Anions, Ion Chromatography	NP/P	NP/P	NP/P		
410.4	COD	NP	NP	NP		
1010	Ignitability, Pensky-Martens Closed-Cup Method	SW		SW		
10-107-06-2	Nitrogen, Total Kjeldahl	NP NP	NP	NP		
7196A	Chromium, Hexavalent	NP/SW		NP/SW		
9012A	Cyanide, Total and/or Amenable	NP/SW NP		NP/SW NP		
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	NP NP		NP NP		
9040B	pH	SW		SW		
9045C L107041C	pH Nitrogen, Nitrate	NP	P	NP/P		
L107-04-1C L107-06-1B		NP NP	NP	NP/P		
L204001A CN	Nitrogen Ammonia Cyanide, Total	P	NP/P	NP/P		
L210-001A	Phenolics, Total Recoverable	NP	NP	NP		
SM 2320B	Alkalinity	NP/P	NP/P	NP/P		1
SM 2510B	Conductivity, Specific Conductance	NP/P	NP/P	NP/P		
SM 2540C	Solids, Total Dissolved (TDS)	NP/P	NP/P	NP/P		1
SM 2540D	Solids, Total Suspended (TSS)	NP	NP	NP		
SM 3500 CR D	Chromium, Hexavalent	NP		NP		1
SM 4500 H+ B	pH	NP/P	NP/P	NP/P		1
SM 4500 NO2 B	Nitrogen, Nitrite	NP	Р	NP/P		
SM 4500 P E	Phosphorus, Orthophosphate	NP/P	NP	NP/P		
SM 4500 P E	Phosphorus, Total	NP	NP	NP		1
	Sulfide, Total	NP		NP		1
SM 4500 S2 D	Cumas, rotal					
SM 4500 S2 D SM 5210B	BOD, 5-Day	NP	NP	NP		

Not all organic compounds are accreditied under NELAC

For methods with multiple compounds all compounds may not meet NELAC criteria, listing should be obtained from the laboratory The lab carries additional accreditations with several states. This is the laboratories typical listing but is subject to change based on the laboratories current certification standing.

Login Sample Receipt Check List

Client: Olin Corporation Job Number: 360-29918-1

Login Number: 29918 List Source: TestAmerica Westfield

Creator: Beaumier, Janine E

List Number: 1

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	False	9.0C
Cooler Temperature is recorded.	True	3.0C
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

Page 1 of 2

White = Lab file Pink = Customer copy

Chain of Custody Form

007193

port to? ☐	office	Quote#	•	,			
<u></u>	use	iote#	Westfield	(F) 413-572-3707	(P) 413-572-4000	Westfield, MA 01085	●53 Southampton Hoad
(Special Instructions)	Comments	PO#	Boston - Service Center	(F) 781-466-6901	(P) 781-466-6900	Waltham, MA 02451	■240 Bear Hill Rd., Suite 104
	(09/	22	2/	2(1	0

TestAmerica Westfield	John Delustra	Relination by Lay	Relinquished by/	λl	SPIPO ON CA	Som ds.	Gw 785	PZ 17RR	PZIBRE	1881 20	640 2005 DUP	GE	6m 30d 5		86K 798	Sample I.D.	S-Solids/Soil O-Oil, "Z" Other	DW-Drinking Water, SW-Surface Water,	Sample Type Codes: WWW.Workship	STANDARD RUSH	requested lurnaround time (PL	1 =	mosterimia)	Address: 51 EAMOS	Client Dim Gaparat	
777	Date:	92.75 1920	100/	Date:	0 6 0 L	FE 739	6w B6	EW 86	Sw BF	98 mg	Sw Bb	6m 36	8 mg	Gw B/2	CW RG	Sample Type Sampler's Initials			(Lab Approval Required)		(PLEASE SPECIFY)	SHAND	C8870 0W	45	5 AT 100	
	Time:	(70)	100 3:00	Time		3/1/10	1/2/2	9/1/10	X 01/18/8	8/31/10	0 0	8/31/10	0.78.4	9/1/2/8	135/10	Collected pH. ✓ (lab u	Date Se only)	\$ 1.5 T		CTDEP RCP	Regulatory Prograi	Email: be g u	Rep	Site ID & State:	Client Project #:	
	Received by:	Hogelved by:	any	Received hy	Signature:	x 3)> / /	(3P)	X 3P 11	(3p 1 1	X 3P 1	X 3 P 1	× 3°	× 30	× 39 /		Grab Comp. # Containers Plastic(P) or C NaHSO4/Me HNO3 to pH H2SO4 to ph	Glass(G) OH <2	Pre	2./MCP	CT RSR EDD	Regulatory Programs/Presumptive Certainty/QC Forms	Email: beguich Ared @olin.com	StevernorRow			
ے ا		Seemy	Jak S			<u> </u>		>	1	1					/	HCI to pH <2 NaOH to pH Na2S2O3 None / 4° C 524 / 624 525 / 625	>12 >12 \ \ \ \ 82	Preservative 6 70	CLP Rpt (L3 or L4)	PWS DEP Forms	rtainty/QC Forms	Email Rpt:	Beign Guicha			
	Date: T	9/1/10 T	7-16													PCB / Pest EPH / VPH DRO / GRO Metals (Plea Mercury		ide H	Use comments section t	6000-series for wastewater, NPDES 6000-series for groundwater, soil, waste	500-series for drinking water	If Invoice contact or address different	χ <u>.</u>	Shaded areas for office use	#b#0-29918 Quote#	00-100
By		OO: 4 	In TOS			グメ	×	××	メメ	メメメ	ナブ	メメ	メメ	メメメ		General Chei Bacteriologic Toxicity PISS AI/ SPECIFIC Chloride	<u>പൂ</u>					rent,	Report to?	or office use		
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		ked?)/ <i>9.0</i> °°	Samples load Y N							×.								a Cito have been	irnaround time	defined on the	ne analytical	(Special Instructions)	Comments	- 1	Boston - Service Center

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THE LEADER IN ENVIRONMENTAL TES	TestAmeric
TESTING	CQ

Chain of Custody Form

007194

Boston - Service Center	Westfield
(F) 781-466-6901	(F) 413-572-3707
(P) 781-466-6900	(P) 413-572-4000
Waltham, MA 02451	Westfield, MA 01085
●240 Bear Hill Rd., Suite 104	●53 Southampton Road

TestAmerica Westfield	Helmunshed By	Janes July 9-	Relinguished E.	Relinquished by:	Sampled by (print)						(Gran 16 Gran)	Sample I.D. Sample Type		DW-Drinking Water, SW-Surface Water.		STANDARD RUSH	PLEASE SPECIF	Phone: 9786586121 Fax: Sim	A W was town with	Address: 51 comes st	6	
Page 0 of 2	Date: Time: Referred by:	Date: Time: Referred by: 19 1 100 100	Parie: Received by:	\Box	1-5-7-7-7-7-7-7-7-7-7-7-7-7-7-7-7-7-7-7-	The state of the s	Annual Control of the	a)	10 (10 m)		12 1 7 3 X	pH // (lab) Grab Comp. # Container Plastic(P) or NaHSO4/M HNO3 to pH H2SO4 to pH HCI to pH < NaOH to pH Na2S2O3 None / 4° 524 / 62	Glass(G) eOH f <2 H <2 2 f >12 C C 4 / 82	-	Std Rpt (L1)	CTDEP RCP CT RSR FDD Required	Regula	Email: beguich ared @olin.	0,897 Reports Sent To: Steve morrow / Bein Cuicha	Site ID & State:	Client Project #:	THE RESIDENCE THE PROPERTY OF
ner copy	Time: Ry: Ry: Page 9		1 Time: 4.505 Temp @ receipt: 3.0/1.0 %	Cooler 2 N MADEP Requirement Samples idead Y N								EPH / VPI	t / Herbici H O / ETPH ase Speci emistry	de fy)	8000-series for groundwater, soil, waste Statisfactorily answered.	PDES soil, waste	ing water	If Invoice contact or address different, please print legibly. If the analytical	ஆய்voice same as Report to? □ (Spec	Shaded areas for office use Comments	PO#	UUILU4 Westfield Boston - Service Center

FILE COPY



ANALYTICAL REPORT

OF BARAMETERS ORDERED BY:

Job Number: 360-29919-1

Job Description: Olin Chemical Quarterly Surfacewater

For:
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Attention: Mr. Steven Morrow

Joseph a. Cheur J.

Approved for release. Joe Chimi Report Production Repress 9/16/10 4:41 PM

Designee for Becky C Mason Project Manager II becky.mason@testamericainc.com 09/16/2010

Results relate only to the items tested and the sample(s) as received by the laboratory. The test results in this report meet all NELAC requirements for accredited parameters, exceptions are noted in this report. Pursuant to NELAC, this report may not be reproduced except in full, and with written approval from the laboratory. TestAmerica Westfield Certifications and Approvals: MADEP MA014, RIDOH57, CTDPH 0494, VT DECWSD, NH DES 2539, NELAP FL E87912 TOX, NELAP NJ MA008 TOX, NELAP NY 10843, NY ELAP 10843, North Carolina 647, NELAP PA 68-04386. Field sampling is performed under SOPs WE-FLD-001 and WE-FLD-002.



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		Mass	DEP Analytical	Protocol Certif	ication Form	
Labor	atory Name:	TestAmeric	a Westfield	Project #:	360-2991	9-1
Proje	ct Location:			RTN:		
This f	orm provide	s certifications for	the following data	a set: list Laborato	ry Sample ID Number(s)):	
360-2	9919-(1-6)		_			
Matric	es: X	Groundwater/Surfa	ce Water	Soil/Sediment	Drinking Water ☐ Air	other:
CAM	Protocols (check all that ap	ply below):			
8260 \	VOC _	7470/7471 Hg	Mass DEP VPH	8081 Pesticides	7196 Hex Cr	Mass DEP APH
CAM I		7010 Metals	CAM IV A L	CAM V B 4 8151 Herbicides	CAM VI B	CAM IX A
8270 S CAM I		CAM III C	CAM IV B	CAM V C	8330 Explosives CAM VIII A	TO-15 VOC CAM IX B
O7 (IVI)		Cravi III C	C/ WITV B	9014 Total	CAUNTAL	O/ WITH D
6010 I		6020 Metals	8082 PCB	Cyanide/PAC	332.0 Perchlorate	
CAMI	II A 💢	CAM III D	CAM V A	CAM VI A	CAM VIII B	
	Affirmative	Responses to Que	stions A through I	are required for "	Presumptive Certainty" st	atus
		•			d on the Chain-of-Custody,	
Α	properly pres method holdi	,	nperature) in the fie	eld or laboratory, and	d prepared/analyzed within	X Yes No
			nd all associated O	C requirements spec	cified in the selected CAM	Lances NO
В	protocol(s) fo	ollowed?				XYes No
С				esponse actions spe ce standard non-cor	ecified in the selected CAM formances?	XYes No
D				• .	ecified in CAM VII A, nd Reporting of Analytical	X Yes No
			-	thod conducted with	_	Yes No
E		, ,	, ,	or a list of significan analyte list reporte	*	☐Yes ☐ No
F	Were all app	licable CAM protoco	ol QC and performa	nce standard non-c	onformances identified and	
			`		stions A through E)? sumptive Certainty" statu:	
	•		•	ing limits specified in	-	,
G	protocol(s)?	orting limits at or be	elow all CAM report	ing iimis specified ii	Title Selected CAIVI	X Yes No1
	User Note: D		-	_	essarily meet the data usabi	lity and
		-		1056 (2)(k) and WCS		
Н	Were all QC	performance stand	ards specified in the	e CAM protocol(s) a	chieved?	X Yes No
			•	•	eted CAM protocol(s) ?	Yes X No
¹ All no	egative respo	nses must be addre	essed in an attached	d laboratory narrative	e. 	
obtain					oon my personal inquiry of the best of my knowledge and	
Signat	ture:	State	otua	Position:	Laboratory D	Director
Printe	d Name:	Steven C.	Hartmann	Date:	9/16/10 1	6:34

CASE NARRATIVE

Client: Olin Corporation

Project: Olin Chemical Quarterly Surfacewater

Report Number: 360-29919-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 09/01/2010; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 3.0 C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2 C of the required temperature or method specified range. For samples with a specified temperature of 4 C, samples with a temperature ranging from just above freezing temperature of water to 6 C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

TOTAL METALS (ICP)

Samples OC-PZ 18 R SW (360-29919-1), OC-ISCO 1 (360-29919-2), OC-ISCO 2 (360-29919-3), OC-ISCO 3 (360-29919-4), OC-PZ 16 RR SW (360-29919-5) and OC-PZ 17 RR SW (360-29919-6) were analyzed for total metals (ICP) in accordance with EPA SW-846 Method 6010B. The samples were prepared on 09/02/2010 and analyzed on 09/03/2010.

Chromium was detected in method blank MB 360-62734/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged "J". If the associated sample reported a result above the MDL and/or RL, the result has been "B" flagged. Refer to the QC report for details.

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No other difficulties were encountered during the metals analyses.

All other quality control parameters were within the acceptance limits.

DISSOLVED METALS

Samples OC-PZ 18 R SW (360-29919-1), OC-ISCO 1 (360-29919-2), OC-ISCO 2 (360-29919-3), OC-ISCO 3 (360-29919-4), OC-PZ 16 RR SW (360-29919-5) and OC-PZ 17 RR SW (360-29919-6) were analyzed for dissolved metals in accordance with EPA SW-846 Method 6010B. The samples were analyzed on 09/07/2010 and 09/08/2010.

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No difficulties were encountered during the dissolved metals analyses.

All quality control parameters were within the acceptance limits.

<u>ANIONS</u>

Samples OC-PZ 18 R SW (360-29919-1), OC-ISCO 1 (360-29919-2), OC-ISCO 2 (360-29919-3), OC-ISCO 3 (360-29919-4), OC-PZ 16 RR SW (360-29919-5) and OC-PZ 17 RR SW (360-29919-6) were analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 09/03/2010.

Due to a sample management error, sample OC-PZ 17 RR SW (360-29919-6) was analyzed outside of holding time for Nitrate.

Samples OC-PZ 18 R SW (360-29919-1)[10X], OC-ISCO 1 (360-29919-2)[10X], OC-ISCO 2 (360-29919-3)[10X], OC-ISCO 3 (360-29919-4)[10X], OC-PZ 16 RR SW (360-29919-5)[10X] and OC-PZ 17 RR SW (360-29919-6)[10X] required dilution prior to analysis

due to high target concentration. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the anions analyses.

All quality control parameters were within the acceptance limits.

AMMONIA

Samples OC-PZ 18 R SW (360-29919-1), OC-ISCO 1 (360-29919-2), OC-ISCO 2 (360-29919-3), OC-ISCO 3 (360-29919-4), OC-PZ 16 RR SW (360-29919-5) and OC-PZ 17 RR SW (360-29919-6) were analyzed for ammonia in accordance with Lachat 107-06-1B. The samples were prepared on 09/03/2010 and analyzed on 09/03/2010 and 09/09/2010.

Samples OC-PZ 18 R SW (360-29919-1)[10X], OC-ISCO 2 (360-29919-3)[10X] and OC-PZ 17 RR SW (360-29919-6)[5X] required dilution prior to analysis due to high concentration. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the ammonia analyses.

All quality control parameters were within the acceptance limits.

SPECIFIC CONDUCTIVITY

Samples OC-PZ 18 R SW (360-29919-1), OC-ISCO 1 (360-29919-2), OC-ISCO 2 (360-29919-3), OC-ISCO 3 (360-29919-4), OC-PZ 16 RR SW (360-29919-5) and OC-PZ 17 RR SW (360-29919-6) were analyzed for specific conductivity in accordance with SM20 2510B. The samples were analyzed on 09/08/2010.

Sample OC-ISCO 2 (360-29919-3)[2X] required dilution prior to analysis due to high concentration. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the conductivity analyses.

All quality control parameters were within the acceptance limits.

NITRITE

Samples OC-PZ 18 R SW (360-29919-1), OC-ISCO 1 (360-29919-2), OC-ISCO 2 (360-29919-3), OC-ISCO 3 (360-29919-4), OC-PZ 16 RR SW (360-29919-5) and OC-PZ 17 RR SW (360-29919-6) were analyzed for Nitrogen-Nitrite in accordance with SM20 4500 NO2 B. The samples were analyzed on 09/01/2010.

No difficulties were encountered during the nitrite analyses.

All quality control parameters were within the acceptance limits.

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation Job Number: 360-29919-1

Lab Sample ID C Analyte	lient Sample ID	Result / Qua	alifier	Reporting Limit	Units	Method
360-29919-1	OC-PZ 18 R SW					
Aluminum Chromium Sodium Sulfate Chloride Nitrate as N Ammonia Specific Conductance		1000 18 55000 200 64 0.22 21 660	В	100 5.0 2000 20 10 0.050 1.0	ug/L ug/L ug/L mg/L mg/L mg/L um/os/cm	6010B 6010B 6010B 300.0 300.0 300.0 L107-06-1B SM 2510B
Dissolved Aluminum Chromium Sodium		1100 12 61000		100 5.0 2000	ug/L ug/L ug/L	6010B 6010B 6010B
360-29919-2	OC-ISCO 1					
Aluminum Chromium Sodium Sulfate Chloride Nitrate as N Ammonia Specific Conductance		950 15 47000 180 60 0.29 19 620	В	100 5.0 2000 20 10 0.050 0.10 1.0	ug/L ug/L ug/L mg/L mg/L mg/L mg/L umhos/cm	6010B 6010B 6010B 300.0 300.0 100.0 L107-06-1B SM 2510B
Dissolved Aluminum Chromium Sodium		1100 10 55000		100 5.0 2000	ug/L ug/L ug/L	6010B 6010B 6010B
360-29919-3	OC-ISCO 2					
Aluminum Chromium Sodium Sulfate Chloride Nitrate as N Ammonia Specific Conductance		360 65 140000 480 170 3.1 63 1600	В	100 5.0 2000 20 10 0.050 1.0 2.0	ug/L ug/L ug/L mg/L mg/L mg/L mg/L umhos/cm	6010B 6010B 6010B 300.0 300.0 300.0 L107-06-1B SM 2510B
Dissolved Aluminum Chromium Sodium		56 13 150000	J	100 5.0 2000	ug/L ug/L ug/L	6010B 6010B 6010B

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation Job Number: 360-29919-1

Lab Sample ID CI Analyte	lient Sample ID	Result / Qu	ıalifier	Reporting Limit	Units	Method
360-29919-4	OC-ISCO 3					
Aluminum Chromium Sodium Sulfate Chloride		35 1.8 79000 22 190	J J B	100 5.0 2000 2.0 10	ug/L ug/L ug/L mg/L mg/L	6010B 6010B 6010B 300.0 300.0
Nitrate as N Ammonia Specific Conductance		1.0 0.70 720		0.050 0.10 1.0	mg/L mg/L umhos/cm	300.0 L107-06-1B SM 2510B
Dissolved Sodium		91000		2000	ug/L	6010B
360-29919-5	OC-PZ 16 RR SW					
Aluminum Chromium Sodium Sulfate Chloride Nitrate as N Ammonia Specific Conductance		1100 220 140000 180 250 5.1 19	В	100 5.0 2000 20 10 0.050 0.10 1.0	ug/L ug/L ug/L mg/L mg/L mg/L mg/L umhos/cm	6010B 6010B 6010B 300.0 300.0 300.0 L107-06-1B SM 2510B
Dissolved Aluminum Chromium Sodium		69 13 140000	J	100 5.0 2000	ug/L ug/L ug/L	6010B 6010B 6010B
360-29919-6	OC-PZ 17 RR SW					
Aluminum Chromium Sodium Sulfate Chloride Nitrate as N Ammonia Specific Conductance		940 210 130000 200 230 4.0 25 1200	В	100 5.0 2000 20 10 0.050 0.50	ug/L ug/L ug/L mg/L mg/L mg/L umhos/cm	6010B 6010B 6010B 300.0 300.0 L107-06-1B SM 2510B
Dissolved Aluminum Chromium Sodium		170 66 140000		100 5.0 2000	ug/L ug/L ug/L	6010B 6010B 6010B

METHOD SUMMARY

Client: Olin Corporation Job Number: 360-29919-1

Description	Lab Location	Method Preparation Method
Matrix: Water		
Total Metals	TAL WFD	SW846 6010B
Dissolved Metals	TAL WFD	SW846 6010B
Preparation, Total Metals	TAL WFD	SW846 3010A
Sample Filtration, Field	TAL WFD	FIELD_FLTRD
Chloride & Sulfate	TAL WFD	40CFR136A 300.0
Nitrate & Nitrite	TAL WFD	40CFR136A 300.0
Nitrogen Ammonia	TAL WFD	LACHAT L107-06-1B
Distillation, Ammonia	TAL WFD	Distill/Ammonia
Conductivity, Specific Conductance	TAL WFD	SM SM 2510B
Nitrogen, Nitrite	TAL WFD	SM SM 4500 NO2 B

Lab References:

TAL WFD = TestAmerica Westfield

Method References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

LACHAT = LACHAT

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Olin Corporation Job Number: 360-29919-1

Method	Analyst	Analyst ID
SW846 6010B	Smith, Tim J	TJS
40CFR136A 300.0	Emerich, Rich W	RWE
LACHAT L107-06-1B	Emerich, Rich W	RWE
SM SM 2510B SM SM 2510B	Emerich, Rich W Stewart, Alyse M	RWE AMS
SM SM 4500 NO2 B	Emerich, Rich W	RWE

SAMPLE SUMMARY

Client: Olin Corporation Job Number: 360-29919-1

			Date/Time	Date/Time
Lab Sample ID	Client Sample ID	Client Matrix	Sampled	Received
360-29919-1	OC-PZ 18 R SW	Water	09/01/2010 1205	09/01/2010 1700
360-29919-2	OC-ISCO 1	Water	09/01/2010 1220	09/01/2010 1700
360-29919-3	OC-ISCO 2	Water	09/01/2010 1300	09/01/2010 1700
360-29919-4	OC-ISCO 3	Water	09/01/2010 1325	09/01/2010 1700
360-29919-5	OC-PZ 16 RR SW	Water	09/01/2010 1400	09/01/2010 1700
360-29919-6	OC-PZ 17 RR SW	Water	09/01/2010 1025	09/01/2010 1700

SAMPLE RESULTS

Client Sample ID:

OC-PZ 18 R SW

Lab Sample ID:

360-29919-1

Client Matrix:

Water

Date Sampled: 09/01/2010 1205

Date Received: 09/01/2010 1700

6010B Total Metals

Method: Preparation:

6010B 3010A 1.0

Dilution: Date Analyzed:

Date Prepared:

09/03/2010 1557 09/02/2010 0906 Analysis Batch: 360-62834 Prep Batch: 360-62734

Qualifier

Instrument ID:

Lab File ID: Initial Weight/Volume: Varian ICP 090310.csv

50 mL

Final Weight/Volume: 50 mL

Analyte Aluminum Chromium

Sodium

Result (ug/L) 1000 18

55000

15 1.0 250

MDL

100 5.0 2000

RL

6010B Dissolved Metals-Dissolved

Method:

Preparation: N/A 1.0

Dilution:

09/07/2010 1714 Date Analyzed:

Date Prepared:

6010B Analysis Batch: 360-62881 Instrument ID:

Lab File ID:

Varian ICP 090710c.csv

Initial Weight/Volume:

Final Weight/Volume:

1.0 mL

Analyte Result (ug/L) Qualifier MDL RL Aluminum 1100 15 100 Chromium 12 1.0 5.0 Sodium 61000 250 2000

1/1/2/ (lla 10/3/10

Job Number: 360-29919-1

Client Sample ID:

OC-ISCO 1

Lab Sample ID:

360-29919-2

Client Matrix:

Water

Date Sampled: 09/01/2010 1220

Date Received: 09/01/2010 1700

6010B Total Metals

Method:

6010B 3010A

Preparation: Dilution:

1.0

Date Analyzed:

09/03/2010 1617

Date Prepared: 09/02/2010 0906 Analysis Batch: 360-62834

Prep Batch: 360-62734

Instrument ID:

Lab File ID:

Varian ICP 090310.csv 50 mL

Initial Weight/Volume: Final Weight/Volume:

50 mL

Analyte	Result (ug/L) Qualif		MDL	RL
Aluminum	950 -		15	100
Chromium	15	8	1.0	5.0
Sodium	47000		250	2000

6010B Dissolved Metals-Dissolved

Method:

6010B Preparation:

N/A 1.0

Dilution: 09/07/2010 1717 Date Analyzed:

Date Prepared:

Analysis Batch: 360-62881

Instrument ID:

Lab File ID:

Varian ICP 090710c.csv

Initial Weight/Volume:

Final Weight/Volume:

Mphl Chi

1.0 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Aluminum	1100		15	100
Chromium	10		1.0	5.0
Sodium	55000		250	2000

Page 13 of 45

Job Number: 360-29919-1

Client Sample ID:

OC-ISCO 2

Lab Sample ID:

360-29919-3

Client Matrix:

Water

Date Sampled: 09/01/2010 1300

Date Received: 09/01/2010 1700

6010B Total Metals

Method: Preparation:

6010B 3010A

Dilution: Date Analyzed:

Date Prepared:

1.0

09/03/2010 1620 09/02/2010 0906 Analysis Batch: 360-62834

Prep Batch: 360-62734

Instrument ID:

Lab File ID:

Varian ICP 090310.csv Initial Weight/Volume: 50 mL

Final Weight/Volume:

50 mL

Analyte Result (ug/L) Qualifier MDL RL Aluminum 360 15 100 Chromium 65 1.0 5.0 Sodium 140000 250 2000

6010B Dissolved Metals-Dissolved

Method:

6010B

Preparation:

N/A 1.0

Dilution:

Date Analyzed: 09/07/2010 1720

Date Prepared:

Analysis Batch: 360-62881

Instrument ID:

Varian ICP Lab File ID: 090710c.csv

Initial Weight/Volume:

Final Weight/Volume:

1.0 mL

MDL RL Analyte Result (ug/L) Qualifier Aluminum 56 J 15 100 Chromium 13 1.0 5.0 250 2000 Sodium 150000

N/4/Clh

Job Number: 360-29919-1

Client Sample ID:

OC-ISCO 3

Lab Sample ID:

360-29919-4

Client Matrix:

Water

Date Sampled: 09/01/2010 1325

Date Received: 09/01/2010 1700

6010B Total Metals

Method: Preparation:

Dilution:

6010B

3010A 1.0

Date Analyzed: Date Prepared:

09/03/2010 1624 09/02/2010 0906 Analysis Batch: 360-62834

Prep Batch: 360-62734

Instrument ID:

Lab File ID:

Varian ICP 090310.csv

Initial Weight/Volume:

50 mL

Final Weight/Volume:

50 mL

RL Qualifier MDL Result (ug/L) Analyte 15 100 Aluminum 35 1.0 5.0 Chromium 1.8 JB 250 2000 Sodium 79000

6010B Dissolved Metals-Dissolved

Method:

6010B

Preparation: Dilution:

N/A 1.0

09/08/2010 1212

Date Analyzed: Date Prepared: Analysis Batch: 360-62896

Instrument ID:

Lab File ID:

Varian ICP 090810a.csv

Initial Weight/Volume:

Final Weight/Volume:

1.0 mL

Result (ug/L) Qualifier MDL RL Analyte 15 100 Aluminum ND 5.0 Chromium ND 1.0 91000 250 2000 Sodium

2/1/h

Job Number: 360-29919-1 Client: Olin Corporation

Client Sample ID:

OC-PZ 16 RR SW

Lab Sample ID:

360-29919-5

Client Matrix:

Water

Date Sampled: 09/01/2010 1400

Date Received: 09/01/2010 1700

6010B Total Metals

Method:

3010A Preparation: Dilution:

1.0

6010B

Date Analyzed: Date Prepared:

09/02/2010 0906

09/03/2010 1627

Analysis Batch: 360-62834

Prep Batch: 360-62734

Instrument ID:

Lab File ID:

Initial Weight/Volume:

Varian ICP 090310.csv 50 mL

Final Weight/Volume:

50 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Aluminum	1100		15	100
Chromium	220	B	1.0	5.0
Sodium	140000		250	2000

6010B Dissolved Metals-Dissolved

Method:

6010B

Preparation:

N/A 1.0

Dilution: .

09/08/2010 1215 Date Analyzed:

Date Prepared:

Analysis Batch: 360-62896

Instrument ID:

Varian ICP 090810a.csv Lab File ID:

Initial Weight/Volume:

Final Weight/Volume:

1.0 mL

Result (ug/L) Analyte Qualifier MDL RL 69 15 100 Aluminum 13 Chromium 1.0 5.0 Sodium 140000 250 2000

N. Chl.

Job Number: 360-29919-1

Client Sample ID:

OC-PZ 17 RR SW

Lab Sample ID:

360-29919-6

Client Matrix:

Water

Date Sampled: 09/01/2010 1025

Date Received: 09/01/2010 1700

6010B Total Metals

Method:

Preparation: 3010A Dilution: 1.0

Date Analyzed: Date Prepared: 09/03/2010 1630 09/02/2010 0906

6010B

Analysis Batch: 360-62834

Prep Batch: 360-62734

Instrument ID:

Lab File ID: Initial Weight/Volume:

Varian ICP 090310.csv 50 mL

Final Weight/Volume:

50 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Aluminum	940		15	100
Chromium	210	В	1.0	5.0
Sodium	130000		250	2000

6010B Dissolved Metals-Dissolved

Method:

6010B

Preparation:

N/A 1.0

Dilution:

Date Analyzed:

09/08/2010 1223

Date Prepared:

Analysis Batch: 360-62896

Instrument ID: Lab File ID:

Varian ICP 090810a.csv

Initial Weight/Volume:

Final Weight/Volume:

1.0 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Aluminum	170		15	100
Chromium	66		1.0	5.0
Sodium	140000		250	2000

NM 10/2/10

General Chemistry

Client Sample ID: OC-PZ 18 R SW

Lab Sample ID: 360-29919-1 Date Sampled: 09/01/2010 1205

Client Matrix: Water Date Received: 09/01/2010 1700

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Sulfate	200		mg/L	20	20	10	300.0
	Analysis Batch: 360-63039	Date Analyzed	: 09/03/2010	1352			
Chloride	64		mg/L	10	10	10	300.0
	Analysis Batch: 360-63039	Date Analyzed	: 09/03/2010	1352			
Nitrate as N	0.22		mg/L	0.050	0.050	1.0	300.0
	Analysis Batch: 360-63036	Date Analyzed	: 09/03/2010	1151			
Ammonia	21		mg/L	1.0	1.0	10	L107-06-1B
	Analysis Batch: 360-62812	Date Analyzed	: 09/03/2010	1503			
	Prep Batch: 360-62783	Date Prep	pared: 09/03/2	010 1039			
Specific Conductan	ice 660		umhos/cm	1.0	1.0	1.0	SM 2510B
	Analysis Batch: 360-62904	Date Analyzed	: 09/08/2010	1530			
Nitrite as N	ND		mg/L	0.010	0.010	1.0	SM 4500 NO2
	Analysis Batch: 360-62846	Date Analyzed	: 09/01/2010	1749			

General Chemistry

Client Sample ID: OC-ISCO 1

Lab Sample ID: 360-29919-2 Date Sampled: 09/01/2010 1220 Client Matrix: Water

Date Received: 09/01/2010 1700

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Sulfate	180		mg/L	20	20	10	300.0
	Analysis Batch: 360-63039	Date Analyzed	: 09/03/2010	1437			
Chloride	60		mg/L	10	10	10	300.0
	Analysis Batch: 360-63039	Date Analyzed	: 09/03/2010	1437			
Nitrate as N	0.29		mg/L	0.050	0.050	1.0	300.0
	Analysis Batch: 360-63036	Date Analyzed	: 09/03/2010	1206			
Ammonia	19		mg/L	0.10	0.10	1.0	L107-06-1B
	Analysis Batch: 360-62812	Date Analyzed	: 09/03/2010	1438			
	Prep Batch: 360-62783	Date Prep	ared: 09/03/2	010 1039			
Specific Conductan	ce 620		umhos/cm	1.0	1.0	1.0	SM 2510B
	Analysis Batch: 360-62904	Date Analyzed	: 09/08/2010	1532			
Nitrite as N	ND		mg/L	0.010	0.010	1.0	SM 4500 NO2
	Analysis Batch: 360-62846	Date Analyzed	: 09/01/2010	1749			

General Chemistry

Client Sample ID: OC-ISCO 2

Lab Sample ID: 360-29919-3 Date Sampled: 09/01/2010 1300 Client Matrix: Water

Date Received: 09/01/2010 1700

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Sulfate	480		mg/L	20	20	10	300.0
	Analysis Batch: 360-63039	Date Analyzed	: 09/03/2010	1452			
Chloride	170		mg/L	10	10	10	300.0
	Analysis Batch: 360-63039	Date Analyzed	: 09/03/2010	1452			
Nitrate as N	3.1		mg/L	0.050	0.050	1.0	300.0
	Analysis Batch: 360-63036	Date Analyzed	: 09/03/2010	1221			
Ammonia	63		mg/L	1.0	1.0	10	L107-06-1B
	Analysis Batch: 360-63050	Date Analyzed	: 09/09/2010	1406			
	Prep Batch: 360-62783	Date Prep	oared: 09/03/2	2010 1039			
Specific Conductan	ce 1600		umhos/cm	2.0	2.0	2.0	SM 2510B
	Analysis Batch: 360-62942	Date Analyzed	: 09/08/2010	1710			
Nitrite as N	ND		mg/L	0.010	0.010	1.0	SM 4500 NO2
	Analysis Batch: 360-62846	Date Analyzed	: 09/01/2010	1749			

General Chemistry

Client Sample ID: OC-ISCO 3

Lab Sample ID: 360-29919-4 Date Sampled: 09/01/2010 1325 Client Matrix: Water

Date Received: 09/01/2010 1700

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Sulfate	22		mg/L	2.0	2.0	1.0	300.0
A	nalysis Batch: 360-63039	Date Analyzed:	: 09/03/2010	1237			
Chloride	190		mg/L	10	10	10	300.0
Α	nalysis Batch: 360-63039	Date Analyzed:	09/03/2010	1508			
Nitrate as N	1.0		mg/L	0.050	0.050	1.0	300.0
Α	nalysis Batch: 360-63036	Date Analyzed:	09/03/2010	1252			
Ammonia	0.70		mg/L	0.10	0.10	1.0	L107-06-1B
A	nalysis Batch: 360-62812	Date Analyzed:	: 09/03/2010	1442			
	Prep Batch: 360-62783	Date Prep	ared: 09/03/2	010 1039			
Specific Conductance	720		umhos/cm	1.0	1.0	1.0	SM 2510B
A	nalysis Batch: 360-62904	Date Analyzed:	09/08/2010	1534			
Nitrite as N	ND		mg/L	0.010	0.010	1.0	SM 4500 NO2
А	nalysis Batch: 360-62846	Date Analyzed:	09/01/2010	1749			

General Chemistry

Client Sample ID: OC-PZ 16 RR SW

Lab Sample ID: 360-29919-5 Date Sampled: 09/01/2010 1400

Client Matrix: Water Date Received: 09/01/2010 1700

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Sulfate	180		mg/L	20	20	10	300.0
	Analysis Batch: 360-63039	Date Analyzed	: 09/03/2010 1	523			
Chloride	250		mg/L	10	10	10	300.0
	Analysis Batch: 360-63039	Date Analyzed	: 09/03/2010 1	523			
Nitrate as N	5.1		mg/L	0.050	0.050	1.0	300.0
	Analysis Batch: 360-63036	Date Analyzed	: 09/03/2010 1	252			
Ammonia	19		mg/L	0.10	0.10	1.0	L107-06-1B
	Analysis Batch: 360-62812	Date Analyzed	: 09/03/2010 1	443			
	Prep Batch: 360-62783	Date Prep	pared: 09/03/2	010 1039			
Specific Conductan	ce 1200		umhos/cm	1.0	1.0	1.0	SM 2510B
	Analysis Batch: 360-62904	Date Analyzed	: 09/08/2010 1	536			
Nitrite as N	ND		mg/L	0.010	0.010	1.0	SM 4500 NO2
	Analysis Batch: 360-62846	Date Analyzed	: 09/01/2010 1	749			

Job Number: 360-29919-1

General Chemistry

Client Sample ID:

OC-PZ 17 RR SW

Lab Sample ID:

360-29919-6

Client Matrix:

Water

Date Sampled: 09/01/2010 1025

Date Received: 09/01/2010 1700

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Sulfate	200		mg/L	20	20	10	300.0
	Analysis Batch: 360-63039	Date Analyzed	: 09/03/2010	1538			
Chloride	230		mg/L	10	10	10	300.0
	Analysis Batch: 360-63039	Date Analyzed	: 09/03/2010	1538			
Nitrate as N	4.0	-# 7	mg/L	0.050	0.050	1.0	300.0
	Analysis Batch: 360-63036	Date Analyzed	: 09/03/2010	1307			
Ammonia	25		mg/L	0.50	0.50	5.0	L107-06-1B
	Analysis Batch: 360-63050	Date Analyzed	: 09/09/2010	1407			
	Prep Batch: 360-62783	Date Prep	pared: 09/03/2	2010 1039			
Specific Conducta	ince 1200		umhos/cm	1.0	1.0	1.0	SM 2510B
	Analysis Batch: 360-62904	Date Analyzed	: 09/08/2010	1537			
Nitrite as N	ND		mg/L	0.010	0.010	1.0	SM 4500 NO2
	Analysis Batch: 360-62846	Date Analyzed	: 09/01/2010	1749			

M/Malla/ (Mu 10/2/10

DATA REPORTING QUALIFIERS

Client: Olin Corporation Job Number: 360-29919-1

Lab Section	Qualifier	Description
Metals		
	В	Compound was found in the blank and sample.
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
General Chemistry		
	Н	Sample was prepped or analyzed beyond the specified holding time

QUALITY CONTROL RESULTS

QC Association Summary

		Report			
Lab Sample ID	Client Sample ID	Basis	Client Matrix	Method	Prep Batch
Metals					
Prep Batch: 360-62734					
LCS 360-62734/2-A	Lab Control Sample	Т	Water	3010A	
LCSD 360-62734/3-A	Lab Control Sample Duplicate	Т	Water	3010A	
MB 360-62734/1-A	Method Blank	Т	Water	3010A	
360-29919-1	OC-PZ 18 R SW	Т	Water	3010A	
360-29919-1DU	Duplicate	Т	Water	3010A	
360-29919-1MS	Matrix Spike	Т	Water	3010A	
360-29919-1PDS	Post Digestion Spike	Т	Water	3010A	
360-29919-1SD	Serial Dilution	Т	Water	3010A	
360-29919-2	OC-ISCO 1	Т	Water	3010A	
360-29919-3	OC-ISCO 2	Т	Water	3010A	
360-29919-4	OC-ISCO 3	Т	Water	3010A	
360-29919-5	OC-PZ 16 RR SW	Т	Water	3010A	
360-29919-6	OC-PZ 17 RR SW	Т	Water	3010A	
Analysis Batch:360-6283	4				
LCS 360-62734/2-A	Lab Control Sample	Т	Water	6010B	360-62734
LCSD 360-62734/3-A	Lab Control Sample Duplicate	Ť	Water	6010B	360-62734
MB 360-62734/1-A	Method Blank	T.	Water	6010B	360-62734
360-29919-1	OC-PZ 18 R SW	Ť	Water	6010B	360-62734
360-29919-1DU	Duplicate	T.	Water	6010B	360-62734
360-29919-1MS	Matrix Spike	Ť	Water	6010B	360-62734
360-29919-1PDS	Post Digestion Spike	Ť	Water	6010B	360-62734
360-29919-1SD	Serial Dilution	Ť	Water	6010B	360-62734
360-29919-2	OC-ISCO 1	Ť	Water	6010B	360-62734
360-29919-3	OC-ISCO 2	Ť	Water	6010B	360-62734
360-29919-4	OC-ISCO 3	Ť	Water	6010B	360-62734
360-29919-5	OC-PZ 16 RR SW	Ť	Water	6010B	360-62734
360-29919-6	OC-PZ 17 RR SW	T.	Water	6010B	360-62734
Analysis Batch:360-6288	1				
LCS 360-62881/1	Lab Control Sample	Т	Water	6010B	
LCSD 360-62881/5	Lab Control Sample Duplicate	T	Water	6010B	
MB 360-62881/2	Method Blank	Ť	Water	6010B	
360-29919-1	OC-PZ 18 R SW	D.	Water	6010B	
360-29919-2	OC-ISCO 1	D	Water	6010B	
360-29919-3	OC-ISCO 2	D	Water	6010B	
Analysis Batch:360-6289	6				
LCS 360-62896/13	Lab Control Sample	Т	Water	6010B	
LCS 360-62896/13 LCSD 360-62896/26	Lab Control Sample Duplicate	T T	Water	6010B	
MB 360-62896/14	Method Blank	, T	Water	6010B	
360-29919-4	OC-ISCO 3	D	Water	6010B	
360-29919-5	OC-PZ 16 RR SW	D	Water	6010B	
	OC-PZ 16 RR SW OC-PZ 17 RR SW	D			
360-29919-6	00-PZ 11 KK 3W	ט	Water	6010B	

Quality Control Results

Client: Olin Corporation Job Number: 360-29919-1

QC Association Summary

Report

Lab Sample ID Client Sample ID Basis Client Matrix Method Prep Batch

Report Basis

D = Dissolved

T = Total

QC Association Summary

		Report			
Lab Sample ID	Client Sample ID	Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Prep Batch: 360-62783					
LCS 360-62783/2-A	Lab Control Sample	Т	Water	Distill/Ammonia	
MB 360-62783/1-A	Method Blank	Т	Water	Distill/Ammonia	
360-29919-1	OC-PZ 18 R SW	Т	Water	Distill/Ammonia	
360-29919-2	OC-ISCO 1	Т	Water	Distill/Ammonia	
360-29919-3	OC-ISCO 2	Т	Water	Distill/Ammonia	
360-29919-4	OC-ISCO 3	Т	Water	Distill/Ammonia	
360-29919-5	OC-PZ 16 RR SW	Т	Water	Distill/Ammonia	
360-29919-6	OC-PZ 17 RR SW	Т	Water	Distill/Ammonia	
Analysis Batch:360-62812	<u>.</u>				
LCS 360-62783/2-A	Lab Control Sample	Т	Water	L107-06-1B	360-62783
MB 360-62783/1-A	Method Blank	T	Water	L107-06-1B	360-62783
360-29919-1	OC-PZ 18 R SW	T	Water	L107-06-1B	360-62783
360-29919-2	OC-ISCO 1	Т	Water	L107-06-1B	360-62783
360-29919-4	OC-ISCO 3	Т	Water	L107-06-1B	360-62783
360-29919-5	OC-PZ 16 RR SW	Т	Water	L107-06-1B	360-62783
Analysis Batch:360-62846	;				
_CS 360-62846/4	Lab Control Sample	Т	Water	SM 4500 NO2 B	
MB 360-62846/3	Method Blank	Т	Water	SM 4500 NO2 B	
360-29919-1	OC-PZ 18 R SW	Т	Water	SM 4500 NO2 B	
360-29919-2	OC-ISCO 1	Т	Water	SM 4500 NO2 B	
360-29919-3	OC-ISCO 2	Т	Water	SM 4500 NO2 B	
360-29919-4	OC-ISCO 3	Т	Water	SM 4500 NO2 B	
360-29919-5	OC-PZ 16 RR SW	Т	Water	SM 4500 NO2 B	
360-29919-6	OC-PZ 17 RR SW	Т	Water	SM 4500 NO2 B	
Analysis Batch:360-62904	ļ				
_CS 360-62904/1	Lab Control Sample	Т	Water	SM 2510B	
MB 360-62904/4	Method Blank	Т	Water	SM 2510B	
360-29919-1	OC-PZ 18 R SW	Т	Water	SM 2510B	
360-29919-2	OC-ISCO 1	Т	Water	SM 2510B	
360-29919-4	OC-ISCO 3	Т	Water	SM 2510B	
360-29919-5	OC-PZ 16 RR SW	Т	Water	SM 2510B	
360-29919-6	OC-PZ 17 RR SW	Т	Water	SM 2510B	
Analysis Batch:360-62942	!				
_CS 360-62942/3	Lab Control Sample	Т	Water	SM 2510B	
MB 360-62942/2	Method Blank	Ť	Water	SM 2510B	
360-29919-3	OC-ISCO 2	T	Water	SM 2510B	
360-29919-3DU	Duplicate	T.	Water	SM 2510B	

QC Association Summary

		Report			
Lab Sample ID	Client Sample ID	Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:360-630	036				
LCS 360-63036/4	Lab Control Sample	Т	Water	300.0	
MB 360-63036/3	Method Blank	Т	Water	300.0	
360-29919-1	OC-PZ 18 R SW	Т	Water	300.0	
360-29919-2	OC-ISCO 1	Т	Water	300.0	
360-29919-3	OC-ISCO 2	Т	Water	300.0	
360-29919-4	OC-ISCO 3	T	Water	300.0	
360-29919-5	OC-PZ 16 RR SW	T	Water	300.0	
360-29919-6	OC-PZ 17 RR SW	Т	Water	300.0	
Analysis Batch:360-630	039				
LCS 360-63039/4	Lab Control Sample	Т	Water	300.0	
MB 360-63039/3	Method Blank	Т	Water	300.0	
360-29919-1	OC-PZ 18 R SW	Т	Water	300.0	
360-29919-2	OC-ISCO 1	Т	Water	300.0	
360-29919-3	OC-ISCO 2	Т	Water	300.0	
360-29919-4	OC-ISCO 3	Т	Water	300.0	
360-29919-5	OC-PZ 16 RR SW	Т	Water	300.0	
360-29919-6	OC-PZ 17 RR SW	Т	Water	300.0	
Analysis Batch:360-630	050				
LCS 360-62783/2-A	Lab Control Sample	Т	Water	L107-06-1B	360-62783
MB 360-62783/1-A	Method Blank	Т	Water	L107-06-1B	360-62783
360-29919-3	OC-ISCO 2	Т	Water	L107-06-1B	360-62783
360-29919-6	OC-PZ 17 RR SW	Ť	Water	L107-06-1B	360-62783

Report Basis

T = Total

Quality Control Results

Client: Olin Corporation

Job Number: 360-29919-1

Method Blank - Batch 360-62734

Method: 6010B Preparation: 3010A

Lab Sample ID: MB 360-62734/1-A

Client Matrix:

Water

Dilution: Date Analyzed:

09/03/2010 1547

Date Prepared:

09/02/2010 0906

Analysis Batch: 360-62834

Prep Batch: (360-62734

Units: ug/L

Instrument ID: Varian ICP

Lab File ID:

090310.csv

Initial Weight/Volume:

50 mL

Final Weight/Volume:

50 mL

Analyte	Result	Qual	MDL	RL	
Aluminum	ND		15	100	
Chromium	2.48	J	1.0	5.0	
Sodium	ND		250	2000	

Lab Control Sample/

Lab Control Sample Duplicate Recovery Report - Batch: 360-62734

Method: 6010B Preparation: 3010A

LCS Lab Sample ID: LCS 360-62734/2-A

Client Matrix:

Water

Dilution:

1.0

Date Analyzed: Date Prepared:

09/03/2010 1551 09/02/2010 0906 Analysis Batch: 360-62834

Prep Batch: 360-62734

Units: ug/L

Instrument ID: Lab File ID:

Varian ICP 090310.csv

Initial Weight/Volume:

50 mL

Final Weight/Volume:

50 mL

LCSD Lab Sample ID: LCSD 360-62734/3-A

Client Matrix:

Water

Dilution:

Date Analyzed:

Date Prepared:

09/03/2010 1554

09/02/2010 0906

Analysis Batch: 360-62834 Prep Batch: 360-62734

Units: ug/L

Instrument ID:

Varian ICP

Lab File ID:

090310.csv

Initial Weight/Volume:

50 mL

Final Weight/Volume:

50 mL

	9	% Rec.					
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Aluminum	103	106	80 - 120	3	20		
Chromium	104	107	80 - 120	3	20		
Sodium	100	103	80 - 120	3	20		

Quality Control Results

Job Number: 360-29919-1 Client: Olin Corporation

Matrix Spike - Batch: 360-62734

Method: 6010B Preparation: 3010A

Lab Sample ID: 360-29919-1

Client Matrix: Water

Dilution:

1.0

Date Analyzed: Date Prepared:

09/02/2010 0906

09/03/2010 1609

Analysis Batch: 360-62834

Prep Batch: 360-62734

Units: ug/L

Instrument ID: Varian ICP

Lab File ID:

090310.csv

Initial Weight/Volume: 50 mL

Final Weight/Volume:

50 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit Qual	
Aluminum	1000	5000	6240	105	75 - 125	
Chromium	18	1000	1050	104 /	75 - 125	
Sodium	55000	20000	72600	90 /	75 - 125	

Post Digestion Spike - Batch: 360-62734

Method: 6010B Preparation: 3010A

Lab Sample ID: 360-29919-1

Client Matrix:

Water 1.0

Dilution:

Date Analyzed: 09/03/2010 1615

Date Prepared: 09/02/2010 0906

Analysis Batch: 360-62834 Prep Batch: 360-62734

Units: ug/L

Instrument ID: Varian ICP

Lab File ID:

090310.csv

Initial Weight/Volume: 50 mL

Final Weight/Volume:

50 mL

% Rec. Limit Qual Sample Result/Qual Spike Amount Result Analyte 98/ 1000 5000 5930 75 - 125 Aluminum 97 / 75 - 125 990 18 1000 Chromium 84 75 - 125 20000 71500 Sodium 55000

Job Number: 360-29919-1 Client: Olin Corporation

Duplicate - Batch: 360-62734

Method: 6010B Preparation: 3010A

Lab Sample ID: 360-29919-1 Client Matrix: Water

Analysis Batch: 360-62834 Prep Batch: 360-62734

Lab File ID:

Instrument ID: Varian ICP 090310.csv

Dilution: 1.0

Units: ug/L

Initial Weight/Volume: 50 mL Final Weight/Volume: 50 mL

Date Analyzed: 09/03/2010 1600 Date Prepared: 09/02/2010 0906

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Aluminum	1000	945	7 /	20	
Chromium	18	15.5	15 /	20	
Sodium	55000	49100	11	20	

Serial Dilution - Batch: 360-62734

Method: 6010B Preparation: 3010A

Lab Sample ID: 360-29919-1

Analysis Batch: 360-62834

Instrument ID: Varian ICP

Client Matrix: Water Dilution:

5.0

Prep Batch: 360-62734

090310.csv Lab File ID: Initial Weight/Volume: 50 mL

Date Analyzed: 09/03/2010 1612

Units: ug/L

Date Prepared: 09/02/2010 0906

Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Result	%Diff	Limit	Qual
Aluminum	1000	1070 -	5.9	10	
Chromium	18	13.5	NC	10	J
Sodium	55000	56600	3.8	10	
			4		

Client: Olin Corporation

Job Number: 360-29919-1

Method Blank - Batch: 360-62881

Method: 6010B Preparation: N/A

Lab Sample ID: MB 360-62881/2

Analysis Batch: 360-62881

Instrument ID: Varian ICP

Client Matrix:

Water

Lab File ID:

090710c.csv

Dilution:

1.0

Prep Batch: N/A Units: ug/L

Initial Weight/Volume:

Date Analyzed:

09/07/2010 1554

Final Weight/Volume:

1.0 mL

Date Prepared:

Analyte	Result	Qual	MDL	RL
Aluminum	ND		15	100
Chromium	ND /		1.0	5.0
Sodium	ND /		250	2000

Lab Control Sample/

Lab Control Sample Duplicate Recovery Report - Batch: 360-62881

Method: 6010B Preparation: N/A

LCS Lab Sample ID: LCS 360-62881/1

Varian ICP

Client Matrix:

Water

Analysis Batch: 360-62881

Analysis Batch: 360-62881

Instrument ID: 090710c.csv

Dilution:

Prep Batch: N/A

Lab File ID: Initial Weight/Volume:

Date Analyzed:

1.0

Units: ug/L

Final Weight/Volume:

10 mL

Date Prepared:

LCSD Lab Sample ID: LCSD 360-62881/5

09/07/2010 1551

Instrument ID:

Varian ICP

Client Matrix:

Water

090710c.csv

Prep Batch: N/A

Lab File ID:

Dilution:

1.0

Date Analyzed:

Units: ug/L 09/07/2010 1647

Initial Weight/Volume:

Final Weight/Volume:

10 mL

Date Prepared: N/A

				RPD Limit	LCS Qual	LCSD Qual
108	99	80 - 120	9	20		
106	101	80 - 120	5	20		
106	102	80 - 120	3	20		
	106	106 101	106 101 80 - 120	106 101 80 - 120 5	106 101 80 - 120 5 20	106 101 80 - 120 5 20

Job Number: 360-29919-1 Client: Olin Corporation

Method Blank - Batch: 360-62896

Method: 6010B Preparation: N/A

Lab Sample ID:

MB 360-62896/14

Analysis Batch: 360-62896

Water

ND

ND

Lab File ID:

Instrument ID: Varian ICP 090810a.csv

Client Matrix: Dilution:

Analyte Aluminum

Chromium

Sodium

1.0

Prep Batch: N/A Units: ug/L

Initial Weight/Volume: Final Weight/Volume:

1.0 mL

5.0

2000

Date Analyzed:

09/08/2010 1052

Date Prepared: N/A

Result	Qual	MDL	RL
ND		15	100

Lab Control Sample/

Lab Control Sample Duplicate Recovery Report - Batch: 360-62896

Method: 6010B Preparation: N/A

1.0

250

LCS Lab Sample ID: LCS 360-62896/13

Analysis Batch: 360-62896

Varian ICP Instrument ID:

Client Matrix:

Water

Lab File ID:

1.0

Prep Batch: N/A

090810a.csv

Dilution:

Units: ug/L

Initial Weight/Volume:

Date Analyzed:

09/08/2010 1049

Final Weight/Volume:

10 mL

Date Prepared:

N/A

LCSD Lab Sample ID: LCSD 360-62896/26

Analysis Batch: 360-62896

Instrument ID: Varian ICP

Client Matrix:

Water

Prep Batch: N/A

090810a.csv Lab File ID:

Dilution:

1.0

Units: ug/L

Initial Weight/Volume:

Date Analyzed:

09/08/2010 1142

Date Prepared:

N/A

Final Weight/Volume: 10 mL

		% Rec.					
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Aluminum	100	96	80 - 120	4	20		
Chromium	99	96	80 - 120	4	20		
Sodium	99	95	80 - 120	4	20		
		/					

Job Number: 360-29919-1 Client: Olin Corporation

Method Blank - Batch: 360-63036

Method: 300.0 Preparation: N/A

Lab Sample ID:

MB 360-63036/3

Analysis Batch: 360-63036

Instrument ID: No Equipment Assigned

Client Matrix:

Water

Prep Batch: N/A

Lab File ID: N/A

Dilution:

1.0

Initial Weight/Volume:

1.0 mL

Date Analyzed:

09/03/2010 1106

Units: mg/L

Final Weight/Volume:

1.0 mL

Date Prepared:

Result

Qual

RL

RL

Nitrate as N

Analyte

ND /

0.050

0.050

Lab Control Sample - Batch: 360-63036

Method: 300.0

Preparation: N/A

Lab Sample ID:

LCS 360-63036/4

09/03/2010 1121

Client Matrix:

Water

Analysis Batch: 360-63036

Instrument ID: No Equipment Assigned

Prep Batch: N/A

Lab File ID: N/A

1.0 mL

Dilution:

1.0

Units: mg/L

Spike Amount

Initial Weight/Volume: Final Weight/Volume: 10 mL

Date Analyzed:

Date Prepared: N/A

Analyte

Result

% Rec.

Limit

Qual

Nitrate as N

4.00

3.86

85 - 115

Page 35 of 45

Job Number: 360-29919-1 Client: Olin Corporation

Method Blank - Batch: 360-63039

Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-63039/3 Client Matrix:

Water

Dilution: 1.0

09/03/2010 1106

Date Analyzed:

Date Prepared:

Analysis Batch: 360-63039

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID:

N/A

Initial Weight/Volume: 1.0 mL

Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL	
Sulfate	ND		2.0	2.0	
Chloride	ND		1.0	1.0	

Lab Control Sample - Batch: 360-63039

Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-63039/4

Client Matrix: Dilution:

Water 1.0

Date Analyzed:

09/03/2010 1121

Date Prepared:

Analysis Batch: 360-63039

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: 1.0 mL

Final Weight/Volume:

10 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate Chloride		82.6 39.8	103 //	85 - 115 85 - 115	

Client: Olin Corporation Job Number: 360-29919-1

Method Blank - Batch: 360-62783 Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID: MB 360-62783/1-A

Client Matrix: Water Dilution: 1.0

Date Analyzed: 09/03/2010 1431 Date Prepared: 09/03/2010 1039 Analysis Batch: 360-62812 Prep Batch: 360-62783

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: 50 mL Final Weight/Volume: 50 mL

 Analyte
 Result
 Qual
 RL
 RL

 Ammonia
 ND
 0.10
 0.10

Method Blank - Batch: 360-62783 Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID: MB 360-62783/1-A Analysis Batch

Client Matrix: Water

Dilution: 1.0

Date Analyzed: 09/09/2010 1404 Date Prepared: 09/03/2010 1039 Analysis Batch: 360-63050 Prep Batch: 360-62783

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: 50 mL Final Weight/Volume: 50 mL

 Analyte
 Result
 Qual
 RL
 RL

 Ammonia
 ND
 0.10
 0.10

Client: Olin Corporation Job Number: 360-29919-1

Lab Control Sample - Batch: 360-62783 Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID: LCS 360-62783/2-A Analysis Batch: 360-62812 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: 360-62783 Lab File ID: N/A
Dilution: 1.0 Units: mg/L Initial Weight/Volume: 50 mL

Date Analyzed: 09/03/2010 1432 Final Weight/Volume: 50 mL
Date Prepared: 09/03/2010 1039

 Analyte
 Spike Amount
 Result
 % Rec.
 Limit
 Qual

 Ammonia
 10.0
 9.27
 93
 85 - 115

Lab Control Sample - Batch: 360-62783 Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID: LCS 360-62783/2-A Analysis Batch: 360-63050 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: 360-62783 Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 50 mL

Date Analyzed: 09/09/2010 1405 Final Weight/Volume: 50 mL

Analyte Spike Amount Result % Rec. Limit Qual

Ammonia 10.0 9.77 98 85 - 115

09/03/2010 1039

Date Prepared:

Job Number: 360-29919-1 Client: Olin Corporation

Method Blank - Batch: 360-62904

Method: SM 2510B Preparation: N/A

Lab Sample ID: MB 360-62904/4 Client Matrix:

Water

Dilution:

1.0

09/08/2010 1437 Date Analyzed:

Date Prepared:

Analysis Batch: 360-62904

Prep Batch: N/A

Units: umhos/cm

Instrument ID: Autotitrator

Lab File ID:

10090800.TXT

Initial Weight/Volume:

Final Weight/Volume: 1.0 mL

Qual RL RL Result Analyte ND 1.0 1.0 Specific Conductance

Lab Control Sample - Batch: 360-62904

Method: SM 2510B Preparation: N/A

Lab Sample ID: LCS 360-62904/1

Client Matrix:

Dilution:

Water

Date Analyzed:

09/08/2010 1414

Date Prepared: N/A Analysis Batch: 360-62904

Prep Batch: N/A

Units: umhos/cm

Instrument ID: Autotitrator Lab File ID: 10090800.TXT

Initial Weight/Volume:

Final Weight/Volume: 1.0 mL

Limit Spike Amount Result % Rec. Qual Analyte 85 - 115 Specific Conductance 1410 1390

Client: Olin Corporation

Job Number: 360-29919-1

Method Blank - Batch: 360-62942

Method: SM 2510B Preparation: N/A

Lab Sample ID: MB 360-62942/2

Client Matrix:

Water 1.0

Dilution:

09/08/2010 1701 Date Analyzed:

Date Prepared:

Analysis Batch: 360-62942

Prep Batch: N/A

Units: umhos/cm

Instrument ID: Autotitrator 10090801.TXT

Lab File ID:

Initial Weight/Volume:

Final Weight/Volume:

1.0 mL

Analyte

Specific Conductance

Result ND

Qual

RL

RL

1.0 1.0

Lab Control Sample - Batch: 360-62942

Lab Sample ID: LCS 360-62942/3

Client Matrix:

Water 1.0

Date Analyzed:

Dilution:

09/08/2010 1702

Date Prepared:

N/A

Analysis Batch: 360-62942

Prep Batch: N/A

Units: umhos/cm

Preparation: N/A

Method: SM 2510B

Instrument ID: Autotitrator Lab File ID:

10090801.TXT

Initial Weight/Volume:

Final Weight/Volume:

1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Specific Conductance	1410	1390	99	85 - 115	

Duplicate - Batch: 360-62942

Method: SM 2510B Preparation: N/A

Lab Sample ID:

360-29919-3

Client Matrix:

Water

Dilution:

Date Analyzed:

09/08/2010 1711

Date Prepared:

Analysis Batch: 360-62942

Prep Batch: N/A

Units: umhos/cm

Instrument ID: Autotitrator

Lab File ID: 10090801.TXT

Initial Weight/Volume:

Final Weight/Volume:

1.0 mL

Analyte	Sample Result/Qual	Result	RPD /	Limit	Qual
Specific Conductance	1600	1610	0	20	

Job Number: 360-29919-1 Client: Olin Corporation

Method Blank - Batch: 360-62846

Method: SM 4500 NO2 B

Preparation: N/A

Lab Sample ID: MB 360-62846/3 Client Matrix:

Water

Dilution: 1.0

09/01/2010 1749 Date Analyzed:

N/A

Date Prepared:

Analysis Batch: 360-62846

Prep Batch: N/A

Units: mg/L

Instrument ID: Jenway UV/VIS

Lab File ID: N/A

Initial Weight/Volume: 50 mL

Final Weight/Volume:

50 mL

Analyte

Result

Qual

RL

RL

Nitrite as N

ND

0.010

0.010

Lab Control Sample - Batch: 360-62846

Method: SM 4500 NO2 B

Preparation: N/A

Lab Sample ID: LCS 360-62846/4

Client Matrix:

Water 1.0

Dilution: Date Analyzed:

09/01/2010 1749

Date Prepared: N/A Analysis Batch: 360-62846

Prep Batch: N/A

Units: mg/L

Instrument ID: Jenway UV/VIS

Lab File ID: N/A

Initial Weight/Volume: 50 mL

Final Weight/Volume: 50 mL

Analyte

Result

% Rec.

Limit

Qual

Nitrite as N

0.100

Spike Amount

0.100

100

85 - 115

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State Accreditation Matrix

			State where Primary Accreditation is Carried					
Mathadalaa	Description	New Hampshire			Florida (NELAC)	North		
Method Name 821-R-02-012	Description Toxicity, Acute (48-Hour)(list upon request)	(NELAC) prim.	Mass	Conn	(NELAC) NP	Carolina		
SM 4500 CI F	Chlorine, Residual		NP					
SM 9215E	Heterotrophic Plate Count (SimPlate)		Р					
SM 9222D	Coliforms, Fecal (Membrane Filter)		P/NP					
SM 9223	Coliforms, Total, and E.Coli (Colilert-P/A)		Р					
SM 9224	Coliforms, Total, and E.Coli (Enumeration)		Р					
1103.1	E.coli		ambient/					
Enterolert	Enterococcus		source					
200.8 Rev 5.4	Metals (ICP/MS) (list upon request)	NP/P	NP/P	NP/P				
200.7 Rev 4.4	Metals (ICP)(list upon request)	NP/P	NP/P	NP/P				
6010B	Metals (ICP)(list upon request)	NP/SW		NP/SW				
245.1	Mercury (CVAA)	NP/P	NP	NP/P				
7470A	Mercury (CVAA)	NP		NP				
7471A	Mercury (CVAA)	SW		SW				
SM 2340B	Total Hardness (as CaCO3) by calculation	NP/P	NP	NP/P				
3005A	Preparation, Total Recoverable or Dissolved Metals	NP/P		NP/P				
3010A	Preparation, Total Metals	NP/P		NP/P				
3020A	Preparation, Total Metals	NP/P/SW		NP/P/SW				
3050B	Preparation, Metals	SW		SW		1		
504.1	EDB, DBCP and 1,2,3-TCP (GC)	P	P NP	P NP				
608	Organochlorine Pest/PCBs (list upon request)	NP NP	NP	NP NP				
625 3546	Semivolatile Org Comp (GC/MS)(list upon request) Microwave Extraction	SW		INF				
3546 3510C	Liquid-Liquid Extraction (Separatory Funnel)	NP		NP				
3540C	Soxhlet Extraction	SW		INI				
3550B	Ultrasonic Extraction	SW		SW				
600/4-81-045	Polychlorinated Biphenyls (PCBs) (GC)	OVV	NP	NP				
8081A	Organochlorine Pesticides (GC)(list upon request)	NP/SW	111	NP/SW				
8082A	PCBs by Gas Chromatography(list upon request)	NP/SW		NP/SW				
8270C	Semivolatile Comp.(GC/MS)(list upon request)	NP/SW		NP/SW				
CT ETPH	Conn - Ext. Total petroleum Hydrocarbons (GC)			NP/SW				
MA-EPH	Mass - Extractable Petroleum Hydrocarbons (GC)			NP/SW		NP/SW		
524.2	Volatile Org Comp (GC/MS)(list upon request)	Р	Р	Р				
524.2	Trihalomethane compounds	Р	Р	Р				
624	Volatile Org Comp (GC/MS)(list upon request)	NP	NP	NP				
5035	Closed System Purge and Trap	SW		SW				
5030B	Purge and Trap	NP		NP				
8260B	Volatile Org Comp. (GC/MS)(list upon request)	NP/SW		NP/SW				
MAVPH	Mass - Volatile Petroleum Hydrocarbons (GC)			NP/SW		NP/SW		
180.1	Turbidity, Nephelometric	Р	Р	Р				
300	Anions, Ion Chromatography	NP/P	NP/P	NP/P				
410.4	COD	NP	NP	NP				
1010	Ignitability, Pensky-Martens Closed-Cup Method	SW		SW				
10-107-06-2	Nitrogen, Total Kjeldahl	NP NP	NP	NP				
7196A	Chromium, Hexavalent	NP/SW		NP/SW				
9012A	Cyanide, Total and/or Amenable	NP/SW NP		NP/SW NP				
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	NP NP		NP NP				
9040B	pH	SW		SW				
9045C L107041C	pH Nitrogen, Nitrate	NP	P	NP/P				
L107-04-1C L107-06-1B		NP	NP	NP/P				
L204001A CN	Nitrogen Ammonia Cyanide, Total	P	NP/P	NP/P				
L210-001A	Phenolics, Total Recoverable	NP	NP	NP				
SM 2320B	Alkalinity	NP/P	NP/P	NP/P		1		
SM 2510B	Conductivity, Specific Conductance	NP/P	NP/P	NP/P				
SM 2540C	Solids, Total Dissolved (TDS)	NP/P	NP/P	NP/P		1		
SM 2540D	Solids, Total Suspended (TSS)	NP	NP	NP				
SM 3500 CR D	Chromium, Hexavalent	NP		NP				
SM 4500 H+ B	pH	NP/P	NP/P	NP/P		1		
SM 4500 NO2 B	Nitrogen, Nitrite	NP	Р	NP/P				
SM 4500 P E	Phosphorus, Orthophosphate	NP/P	NP	NP/P				
SM 4500 P E	Phosphorus, Total	NP	NP	NP		1		
	Sulfide, Total	NP		NP		1		
SM 4500 S2 D	Cumas, rotal							
SM 4500 S2 D SM 5210B	BOD, 5-Day	NP	NP	NP				

Not all organic compounds are accreditied under NELAC

For methods with multiple compounds all compounds may not meet NELAC criteria, listing should be obtained from the laboratory The lab carries additional accreditations with several states. This is the laboratories typical listing but is subject to change based on the laboratories current certification standing.

Login Sample Receipt Check List

Client: Olin Corporation Job Number: 360-29919-1

Login Number: 29919 List Source: TestAmerica Westfield

Creator: Beaumier, Janine E

List Number: 1

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	3.0C
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

THE LEADER IN ENVIRONMENTAL TESTING	TestA
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Chain of Custody Form

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		Pr5501v.	requests are not clearly chain-of-custody, the tu will begin after all quest satisfactorily answered.	Please print legibly. If the analytical	(Spec		Westfield	(P) 413-572-4000 (F) 413-572-3707	53 Southampton RoadWestfield, MA 01085
		prosolved metals	requests are not clearly defined on the chain-of-custody, the turnaround time will begin after all questions have been satisfactorily answered.	y. If the analytical	Comments (Special Instructions)	PO#	Boston - Service Center	(F) 781-466-6900 (F) 781-466-6901	●240 Bear Hill Rd., Suite 104 Waltham, MA 02451
44 of 45	5								

TestAmerica Westfield	Relinquished by: Relinquished by: Relinquished by: Relinquished by: Relinquished by: Relinquished by:	Sample Type Codes: WW-Wastewater, DW-Drinking Water, SW-Surface Water, GW-Groundwater, LW Lab Water, A-Air, S-Solids/Soil O-Oil, "Z"-Other Sample I.D. Sw 3 Sw 3 Sw 3 Sw 5 Sw 5	Turnaround T	Phone: 9786586121 Fax: Same	Client: Obus Cosporation	
	Date: Time: Date: Time: Time: P-/~/O (505) Date: Time: P-/~/O (70) Date: Time:	Date Time Collected Supplies	5	8)		
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· •	Date: Date: Date: Date: Date:	Na2S2O3 None / 4° C 524 / 624 / 8260 525 / 625 / 8270			Shaded areas for Invoice same as Re	」 大学 大学 プラン
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omer copy	Temp @ receipt: 30 % Preservation / pH checked? (**) N By: 15 Date: 91/1/0	Prosolved metals Are field filtered	chain-of-custody, the turnaround time will begin after all questions have been satisfactorily answered.	Please print legibly. If the analytical	Comments (Special Instructions)	PO#

		● 53 Sou	●53 Southampton Road ●240 Bear Hill Rd., Suite 104
:TAmerica	Chain of Custody Form		Westfield, MA 01085 Waimam, MA 02491 Westfield, MA 01085 Waimam, MA 02491 Westfield, MA 01085 (F) 781-466-6900 (F) 781-466-6901
DER IN ENVIRONMENTAL TESTING		Į.	
-	Client Project #:	20 Quote#	PO#
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J Fax: SAma	Email: 309 vichard @ olin, com Email Apt:	contact or address different, mments	Please print legibly. If the analytical
und Time (PI	ty/QC Forms	king water	requests are not clearly defined on the chain-of-custody, the turnaround time
		waste	will begin after all questions have been
(Lab Approval Required)	Rpt + QC(L2./MCP		satisfactorily answered.
Type Codes: WW-Wastewater,	Preservative 260	H pify)	Commence.
nking Water, SW-Surface Water,	G)	ЕТР! Эрес	ALL SAMORS
s/Soil O-Oil, "Z"- Other	illassi OH <2 1 <2 >12	ase :	# moo; a + n; + 1,000
	ainers P) or 0 04/Me to pH to p pH < to pH	/ VP / GR (Ple ry al Ch	oitable/oitable
Sample Type Sample Initials	pH V Grab Comp # Con Plastic NaHS HNO3 H2SC HCI tr NaOH Na2S None 524	PCB EPH DRO Meta Merc Gene Bacte Toxic	Chloride, sulfate
18RS43 Sw 84	305 41 21 1		Specific Conductivity
500 / Sw BG	1 36 44	. ~	Diss al/te/na by boloBo
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White = Lab file Pink = Customer copy





ANALYTICAL REPORT

OF BARAMETERS ORDERED BY:

10/8/10

Job Number: 360-30036-1

Job Description: Olin Chemical Surfacewater

For:
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Attention: Mr. Steven Morrow

Joseph a. Chem. J.

Approved for release, Joe Chimi Report Production Representativ 9/23/10 11:46 AM

Designee for
Becky C Mason
Project Manager II
becky.mason@testamericainc.com
09/23/2010

Results relate only to the items tested and the sample(s) as received by the laboratory. The test results in this report meet all NELAC requirements for accredited parameters, exceptions are noted in this report. Pursuant to NELAC, this report may not be reproduced except in full, and with written approval from the laboratory. TestAmerica Westfield Certifications and Approvals: MADEP MA014, RIDOH57, CTDPH 0494, VT DECWSD, NH DES 2539, NELAP FL E87912 TOX, NELAP NJ MA008 TOX, NELAP NY 10843, NY ELAP 10843, North Carolina 647, NELAP PA 68-04386. Field sampling is performed under SOPs WE-FLD-001 and WE-FLD-002.



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		Mass	DEP Analytical	Protocol Certif	fication Form	
Labor	atory Name:	TestAmeric	a Westfield	Project #:	360-3003	36-1
Proje	ct Location:			RTN:		
This f	orm provide	s certifications for	the following data	a set: list Laborato	ry Sample ID Number(s)):	
360-3	0036-1		_			
Matric	es: X	Groundwater/Surfa	ce Water	Soil/Sediment	Drinking Water Air	other:
		check all that ap				
8260 \		~ <u>~</u>	Mass DEP VPH	8081 Pesticides	7196 Hex Cr	Mass DEP APH
CAM I 8270 :		7010 Metals	CAM IV A L	CAM V B 4 8151 Herbicides	CAM VI B 8330 Explosives	CAM IX A L
CAM I		CAM III C	CAM IV B	CAM V C	CAM VIII A	CAM IX B
				9014 Total		
6010 I CAM I		6020 Metals CAM III D	8082 PCB CAM V A	Cyanide/PAC CAM VI A	332.0 Perchlorate CAM VIII B	
CAIVI						
				-	Presumptive Certainty" st	atus
Α		•			d on the Chain-of-Custody,	
_ ^	method holdi	, -	nperature) in the ne	id of laboratory, and	d prepared/analyzed within	X Yes No
В			nd all associated Q	C requirements spe	cified in the selected CAM	
В	protocol(s) fo					X Yes No
С				esponse actions spe ce standard non-cor	ecified in the selected CAM nformances?	X Yes No
D				• .	ecified in CAM VII A, nd Reporting of Analytical	X Yes No
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E	`	, ,	, ,	or a list of significan analyte list reporte	•	Yes ☐ No
		<u>.</u>			onformances identified and	
F	evaluated in	a laboratory narrativ	e (including all "No	responses to Ques	stions A through E)?	X Yes No
	Respons	ses to Questions G	6, H and I below ar	e required for "Pre	sumptive Certainty" statu	S
G	protocol(s)?			ing limits specified in		X Yes No1
				" status may not ned 1056 (2)(k) and WCS	essarily meet the data usabi	lity and
Н		-		e CAM protocol(s) a		Yes X No
ī			•	•	cted CAM protocol(s) ?	Yes X No
¹ All ne			•	d laboratory narrative	• • • • • • • • • • • • • • • • • • • •	100 100
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Signat	ture:	State	ostman	Position:	Laboratory D	Director
Printe	d Name:	Steven C.	Hartmann	Date:	9/23/10 1	1:39

CASE NARRATIVE

Client: Olin Corporation

Project: Olin Chemical Surfacewater

Report Number: 360-30036-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 09/09/2010; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 0.0 C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2 C of the required temperature or method specified range. For samples with a specified temperature of 4 C, samples with a temperature ranging from just above freezing temperature of water to 6 C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

TOTAL METALS (ICP)

Sample OC-SD17SW (360-30036-1) was analyzed for total metals (ICP) in accordance with EPA SW-846 Method 6010B. The sample was prepared on 09/13/2010 and analyzed on 09/14/2010.

Sodium failed the recovery criteria low for the MS of sample OC-SD17SW (360-30036-1) in batch 360-63147. The presence of the '4' qualifier in the report indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount. Sodium failed the recovery criteria low for the post digestion spike of sample OC-SD17SW (360-30036-1) and exceeded the % difference limit for the serial dilution of the sample. The associated LCS and LCSD recovered within control limits. Refer to the QC report for details.

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No other difficulties were encountered during the metals analysis.

All other quality control parameters were within the acceptance limits.

DISSOLVED METALS

Sample OC-SD17SW (360-30036-1) was analyzed for dissolved metals in accordance with EPA SW-846 Method 6010B. The sample was analyzed on 09/21/2010.

Sodium failed the recovery criteria low for the MS of sample OC-SD17SW (360-30036-1) in batch 360-63439. The associated LCS and LCSD recovered within control limits. Refer to the QC report for details.

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No other difficulties were encountered during the dissolved metals analysis.

All other quality control parameters were within the acceptance limits.

ANIONS

Sample OC-SD17SW (360-30036-1) was analyzed for anions in accordance with EPA Method 300.0. The sample was analyzed on 09/09/2010 and 09/21/2010.

Sample OC-SD17SW (360-30036-1)[10X] required dilution prior to analysis due to high target concentration. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the anions analysis.

All quality control parameters were within the acceptance limits.

AMMONIA

Sample OC-SD17SW (360-30036-1) was analyzed for ammonia in accordance with Lachat 107-06-1B. The sample was prepared on 09/14/2010 and analyzed on 09/21/2010.

Sample OC-SD17SW (360-30036-1)[5X] required dilution prior to analysis due to high concentration. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the ammonia analysis.

All quality control parameters were within the acceptance limits.

SPECIFIC CONDUCTIVITY

Sample OC-SD17SW (360-30036-1) was analyzed for specific conductivity in accordance with SM20 2510B. The sample was analyzed on 09/14/2010.

No difficulties were encountered during the conductivity analysis.

All quality control parameters were within the acceptance limits.

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation Job Number: 360-30036-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
200 20020 4	OC-SD17SW				
360-30036-1	OC-201/24A				
Aluminum		1200	100	ug/L	6010B
Chromium		290	5.0	ug/L	6010B
Sodium		99000	2000	ug/L	6010B
Sulfate		310	20	mg/L	300.0
Nitrate as N		1.8	0.050	mg/L	300.0
Chloride		170	10	mg/L	300.0
Ammonia		36	0.50	mg/L	L107-06-1B
Specific Conductano	ce	1200	1.0	umhos/cm	SM 2510B
Dissolved					
Aluminum		250	100	ug/L	6010B
Chromium		110	5.0	ug/L	6010B
Sodium		120000	2000	ug/L	6010B

METHOD SUMMARY

Client: Olin Corporation Job Number: 360-30036-1

Description	Lab Location	Method Preparation Method
Matrix Water		
Metals (ICP)	TAL WFD	SW846 6010B
Preparation, Total Metals	TAL WFD	SW846 3010A
Sample Filtration, Field	TAL WFD	FIELD_FLTRD
Anions, Ion Chromatography	TAL WFD	MCAWW 300.0
Anions, Ion Chromatography	TAL WFD	MCAWW 300.0
Nitrogen Ammonia	TAL WFD	LACHAT L107-06-1B
Distillation, Ammonia	TAL WFD	Distill/Ammonia
Conductivity, Specific Conductance	TAL WFD	SM SM 2510B

Lab References:

TAL WFD = TestAmerica Westfield

Method References:

LACHAT = LACHAT

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Olin Corporation Job Number: 360-30036-1

Method	Analyst	Analyst ID
SW846 6010B	Smith, Tim J	TJS
MCAWW 300.0	Emerich, Rich W	RWE
LACHAT L107-06-1B	Emerich, Rich W	RWE
SM SM 2510B	Stewart, Alyse M	AMS

SAMPLE SUMMARY

Client: Olin Corporation Job Number: 360-30036-1

			Date/Time	Date/Time
Lab Sample ID	Client Sample ID	Client Matrix	Sampled	Received
360-30036-1	OC-SD17SW	Water	09/09/2010 0925	09/09/2010 1500

SAMPLE RESULTS

Job Number: 360-30036-1 Client: Olin Corporation

Client Sample ID:

OC-SD17SW

Lab Sample ID:

360-30036-1

Client Matrix:

Water

Date Sampled: 09/09/2010 0925

Date Received: 09/09/2010 1500

6010B Metals (ICP)

Method:

6010B 3010A

Preparation:

Dilution:

Date Analyzed: Date Prepared: 1.0

09/14/2010 1302 09/13/2010 0807 Analysis Batch: 360-63147

Prep Batch: 360-63066

Instrument ID:

Lab File ID:

Varian ICP 091410b.csv

Initial Weight/Volume:

50 mL

Final Weight/Volume:

50 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Aluminum	1200		15	100
Chromium	290		1.0	5.0
Sodium	99000		250	2000

6010B Metals (ICP)-Dissolved

Method:

6010B N/A

Preparation: Dilution:

1.0

09/21/2010 1528 Date Analyzed:

Date Prepared:

Analysis Batch: 360-63439

Instrument ID:

Varian ICP 092110c.csv

Lab File ID: Initial Weight/Volume:

Final Weight/Volume:

1.0 mL

Analyte Result (ug/L)

Aluminum Chromium Sodium

250 110 120000 MDL 15 1.0 250

100 5.0 2000

RL

Molen Nolphio

Qualifier

Client: Olin Corporation Job Number: 360-30036-1

General Chemistry

Client Sample ID: OC-SD17SW

Lab Sample ID: 360-30036-1 Date Sampled: 09/09/2010 0925

Client Matrix: Water Date Received: 09/09/2010 1500

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Nitrate as N	1.8		mg/L	0.050	0.050	1.0	300.0
	Analysis Batch: 360-63312	Date Analyzed	: 09/09/2010	2048			
Sulfate	310		mg/L	20	20	10	300.0
	Analysis Batch: 360-63466	Date Analyzed	: 09/21/2010	1749			
Chloride	170		mg/L	10	10	10	300.0
	Analysis Batch: 360-63313	Date Analyzed	: 09/09/2010	2303			
Nitrite as N	ND		mg/L	0.10	0.10	10	300.0
	Analysis Batch: 360-63312	Date Analyzed	: 09/09/2010	2303			
Ammonia	36		mg/L	0.50	0.50	5.0	L107-06-1B
	Analysis Batch: 360-63430	Date Analyzed	: 09/21/2010	1503			
	Prep Batch: 360-63132	Date Prep	oared: 09/14/2	2010 0930			
Specific Conductan	ce 1200		umhos/cm	1.0	1.0	1.0	SM 2510B
	Analysis Batch: 360-63309	Date Analyzed	: 09/14/2010	1155			

DATA REPORTING QUALIFIERS

Client: Olin Corporation Job Number: 360-30036-1

Lab Section	Qualifier	Description
Metals		
	4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.
	W	PS: Post-digestion spike was outside control limits
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
	V	Serial Dilution exceeds the control limits

QUALITY CONTROL RESULTS

Client: Olin Corporation Job Number: 360-30036-1

QC Association Summary

		Report			
Lab Sample ID	Client Sample ID	Basis	Client Matrix	Method	Prep Batch
Metals					
Prep Batch: 360-63066					
LCS 360-63066/2-A	Lab Control Sample	Т	Water	3010A	
LCSD 360-63066/3-A	Lab Control Sample Duplicate	Т	Water	3010A	
MB 360-63066/1-A	Method Blank	Т	Water	3010A	
360-30036-1	OC-SD17SW	Т	Water	3010A	
360-30036-1DU	Duplicate	Т	Water	3010A	
360-30036-1MS	Matrix Spike	Т	Water	3010A	
360-30036-1PDS	Post Digestion Spike	Т	Water	3010A	
360-30036-1SD	Serial Dilution	T	Water	3010A	
Analysis Batch:360-6314	17				
LCS 360-63066/2-A	Lab Control Sample	Т	Water	6010B	360-63066
LCSD 360-63066/3-A	Lab Control Sample Duplicate	Т	Water	6010B	360-63066
MB 360-63066/1-A	Method Blank	Т	Water	6010B	360-63066
360-30036-1	OC-SD17SW	Т	Water	6010B	360-63066
360-30036-1DU	Duplicate	Т	Water	6010B	360-63066
360-30036-1MS	Matrix Spike	Т	Water	6010B	360-63066
360-30036-1PDS	Post Digestion Spike	Т	Water	6010B	360-63066
360-30036-1SD	Serial Dilution	Т	Water	6010B	360-63066
Analysis Batch:360-6343	39				
LCS 360-63439/1	Lab Control Sample	Т	Water	6010B	
LCSD 360-63439/7	Lab Control Sample Duplicate	Т	Water	6010B	
MB 360-63439/2	Method Blank	Т	Water	6010B	
360-30036-1	OC-SD17SW	D	Water	6010B	
360-30036-1DU	Duplicate	D	Water	6010B	
360-30036-1MS	Matrix Spike	D	Water	6010B	
360-30036-1SD	Serial Dilution	D	Water	6010B	

Report Basis

D = Dissolved

T = Total

Client: Olin Corporation Job Number: 360-30036-1

QC Association Summary

Report Basis Lab Sample ID **Client Sample ID Client Matrix** Method **Prep Batch General Chemistry** Prep Batch: 360-63132 LCS 360-63132/2-A Lab Control Sample Τ Water Distill/Ammonia Т MB 360-63132/1-A Method Blank Water Distill/Ammonia 360-30036-1 OC-SD17SW Т Water Distill/Ammonia Analysis Batch:360-63309 Т LCS 360-63309/1 Lab Control Sample Water SM 2510B MB 360-63309/4 Method Blank Т Water SM 2510B 360-30036-1 OC-SD17SW Water SM 2510B Analysis Batch:360-63312 LCS 360-63312/4 Lab Control Sample Т Water 300.0 MB 360-63312/3 Т Water 300.0 Method Blank 360-30036-1 OC-SD17SW Т Water 300.0 Analysis Batch:360-63313 LCS 360-63313/4 Т 300.0 Lab Control Sample Water 300.0 MB 360-63313/3 Method Blank Water Τ Т 360-30036-1 OC-SD17SW Water 300.0 Analysis Batch:360-63430 Т Water LCS 360-63132/2-A Lab Control Sample L107-06-1B 360-63132 Т MB 360-63132/1-A Method Blank Water L107-06-1B 360-63132 360-30036-1 OC-SD17SW Т Water L107-06-1B 360-63132 Analysis Batch:360-63466 LCS 360-63466/4 Lab Control Sample Т Water 300.0 MB 360-63466/3 Method Blank Т Water 300.0 OC-SD17SW Т 300.0 360-30036-1 Water

Report Basis

T = Total

Client: Olin Corporation

Job Number: 360-30036-1

Method Blank - Batch: 360-63066

Method: 6010B Preparation: 3010A

Lab Sample ID: MB 360-63066/1-A

Client Matrix:

Water

Analysis Batch: 360-63147

Instrument ID: Varian ICP

Prep Batch: 360-63066

Lab File ID:

091410b.csv

Dilution:

1.0

Units: ug/L

Initial Weight/Volume: Final Weight/Volume:

50 mL 50 mL

Date Analyzed: Date Prepared:

09/14/2010 1248 09/13/2010 0807

Analyte	Result Qual	MDL RL
Aluminum	ND /	15 100
Chromium	ND /	1.0 5.0
Sodium	ND /	250 2000

Lab Control Sample/

Lab Control Sample Duplicate Recovery Report - Batch: 360-63066

Method: 6010B Preparation: 3010A

LCS Lab Sample ID: LCS 360-63066/2-A

Client Matrix:

Water 1.0

Dilution: Date Analyzed:

09/14/2010 1251

Date Prepared:

09/13/2010 0807

Analysis Batch: 360-63147 Prep Batch: 360-63066

Units: ug/L

Instrument ID:

Varian ICP

Lab File ID:

091410b.csv

Initial Weight/Volume:

50 mL

Final Weight/Volume:

50 mL

LCSD Lab Sample ID: LCSD 360-63066/3-A

Client Matrix: Dilution:

Water

Date Analyzed:

Chromium

Sodium

1.0

Date Prepared:

09/14/2010 1254

09/13/2010 0807

Analysis Batch: 360-63147 Prep Batch: 360-63066

Units: ug/L

101

98

Instrument ID:

Varian ICP

Lab File ID:

091410b.csv

RPD Limit LCS Qual

Initial Weight/Volume:

50 mL

Final Weight/Volume:

20

20

20

50 mL

LCSD Qual

% Rec. LCS LCSD Analyte Aluminum 100

96 80 - 120 4 80 - 120 2 99 95 80 - 120 4

RPD

Limit

Client: Olin Corporation Job Number: 360-30036-1

Matrix Spike - Batch: 360-63066

Method: 6010B Preparation: 3010A

Lab Sample ID: 360-30036-1

Client Matrix:

Dilution:

Water

1.0

Date Prepared: 09/13/2010 0807

Date Analyzed: 09/14/2010 1308

Analysis Batch: 360-63147 Prep Batch: 360-63066

Units: ug/L

Instrument ID: Varian ICP

Lab File ID: 091410b.csv

Initial Weight/Volume: 50 mL Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	1200	5000	6020	95	75 - 125	
Chromium	290	1000	1220	93	75 - 125	~
Sodium	99000	20000	114000	74 -)	75 - 125	4

Post Digestion Spike - Batch: 360-63066

Method: 6010B Preparation: 3010A

Lab Sample ID: 360-30036-1

Water

Client Matrix: Dilution: 1.0

Date Analyzed: 09/14/2010 1314 Date Prepared: 09/13/2010 0807

Analysis Batch: 360-63147 Prep Batch: 360-63066

Units: ug/L

Instrument ID: Varian ICP Lab File ID: 091410b.csv Initial Weight/Volume: 50 mL

Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	1200	5000	5950	94	75 - 125	
Chromium	290	1000	1200	91	75 - 125	
Sodium	99000	20000	113000	(72)	75 - 125	W

Client: Olin Corporation Job Number: 360-30036-1

Duplicate - Batch: 360-63066 Method: 6010B Preparation: 3010A

Lab Sample ID: 360-30036-1 Analysis Batch: 360-63147 Instrument ID: Varian ICP

Client Matrix: Water Prep Batch: 360-63066 Lab File ID: 091410b.csv
Dilution: 1.0 Units: ug/L Initial Weight/Volume: 50 mL

Date Analyzed: 09/14/2010 1305 Final Weight/Volume: 50 mL Date Prepared: 09/13/2010 0807

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Aluminum	1200	1410	12	, 20	
Chromium	290	327	12 /	20	
Sodium	99000	110000	11 🗸	20	

Serial Dilution - Batch: 360-63066 Method: 6010B Preparation: 3010A

Preparation: 50 for

 Lab Sample ID:
 360-30036-1
 Analysis Batch:
 360-63147
 Instrument ID:
 Varian ICP

 Client Matrix:
 Water
 Prep Batch:
 360-63066
 Lab File ID:
 091410b.csv

 Dilution:
 5.0
 Units:
 ug/L
 Initial Weight/Volume:
 50 mL

Date Analyzed: 09/14/2010 1311 Final Weight/Volume: 50 mL Date Prepared: 09/13/2010 0807

Analyte	Sample Result/Qual	Result	%Diff	Limit	Qual
Aluminum	1200	1320	6.4	10	
Chromium	290	309	6.5	10	
Sodium	99000	110000	11 🗸	10	V

Client: Olin Corporation

Job Number: 360-30036-1

Method Blank - Batch: 360-63439

Method: 6010B Preparation: N/A

Lab Sample ID: MB 360-63439/2

Client Matrix:

Water

Analysis Batch: 360-63439

Instrument ID: Varian ICP

1.0

Prep Batch: N/A

Lab File ID:

092110c.csv

Dilution:

Units: ug/L

Initial Weight/Volume:

Date Analyzed:

09/21/2010 1525

Final Weight/Volume: 1.0 mL

Date Prepared: N/A

Analyte	Result	Qual	MDL	RL
Aluminum	ND /		15	100
Chromium	ND /		1.0	5.0
Sodium	ND		250	2000

Lab Control Sample/

Lab Control Sample Duplicate Recovery Report - Batch: 360-63439

Method: 6010B Preparation: N/A

LCS Lab Sample ID: LCS 360-63439/1 Client Matrix:

Water

Dilution: 1.0

09/21/2010 1523

Date Analyzed: Date Prepared:

N/A

Analysis Batch: 360-63439

Prep Batch: N/A

Units: ug/L

Instrument ID:

Varian ICP

Lab File ID:

092110c.csv

Initial Weight/Volume:

Final Weight/Volume:

10 mL

LCSD Lab Sample ID: LCSD 360-63439/7

Client Matrix:

Water

Dilution:

1.0

Date Analyzed:

09/21/2010 1558

Date Prepared:

N/A

Analysis Batch: 360-63439

Prep Batch: N/A

Units: ug/L

Instrument ID:

Varian ICP

Lab File ID:

092110c.csv

Initial Weight/Volume:

Final Weight/Volume:

10 mL

9	% Rec.					
LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
102	101	80 - 120	1	20		
101 /	100	80 - 120	8.0	20		
101	100	80 - 120	0.9	20		
	102 101	102 101 101 100	LCS LCSD Limit 102 101 80 - 120 101 100 80 - 120	102 101 80 - 120 1 101 100 80 - 120 0.8	LCS LCSD Limit RPD RPD Limit 102 101 80 - 120 1 20 101 100 80 - 120 0.8 20	LCS LCSD Limit RPD RPD Limit LCS Qual 102 101 80 - 120 1 20 101 100 80 - 120 0.8 20

Client: Olin Corporation

Job Number: 360-30036-1

Matrix Spike - Batch: 360-63439

Method: 6010B Preparation: N/A

Lab Sample ID:

360-30036-1

Client Matrix:

Water

Dilution:

1.0

Date Analyzed:

09/21/2010 1535

Date Prepared: N/A Analysis Batch: 360-63439

Prep Batch: N/A

Units: ug/L

Instrument ID: Varian ICP Lab File ID: 092110c.csv

Initial Weight/Volume:

Final Weight/Volume:

10 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	250	5000	5430	104	75 - 125	
Chromium	110	1000	1110	100	75 - 125	6
Sødium	120000	20000	133000	69	75 - 125	4

Duplicate - Batch: 360-63439

Method: 6010B Preparation: N/A

Lab Sample ID:

360-30036-1

Client Matrix:

Water

Dilution:

1.0

09/21/2010 1531 Date Analyzed:

Date Prepared: N/A Analysis Batch: 360-63439

Prep Batch: N/A

Units: ug/L

Instrument ID: Varian ICP

Lab File ID: 092110c.csv

Initial Weight/Volume:

Final Weight/Volume: 1.0 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Aluminum	250	246	2	20	
Chromium	110	111	1 /	20	
Sodium	120000	118000	0.8	20	

Serial Dilution - Batch: 360-63439

Method: 6010B Preparation: N/A

Lab Sample ID:

360-30036-1

Client Matrix:

Water

Dilution:

5.0

Date Analyzed:

09/21/2010 1538

Date Prepared: N/A Analysis Batch: 360-63439

Prep Batch: N/A

Units: ug/L

Instrument ID: Varian ICP Lab File ID: 092110c.csv

Initial Weight/Volume:

Final Weight/Volume: 1.0 mL

Analyte	Sample Result/Qual	Result	%Diff	Limit	Qual
Aluminum	250	245	NC	10	J
Chromium	110	113	0.008	10	
Sodium	120000	121000	1.8	10	

Client: Olin Corporation

Job Number: 360-30036-1

Method Blank - Batch: 360-63312

Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-63312/3

Client Matrix:

Water

1.0 Dilution:

Date Analyzed: 09/09/2010 1731

Date Prepared:

Analysis Batch: 360-63312

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID:

Initial Weight/Volume: 1.0 mL

Final Weight/Volume:

1.0 mL

RL Result Qual RL Analyte 0.050 0.050 Nitrate as N ND 0.010 0.010 ND Nitrite as N

Lab Control Sample - Batch: 360-63312

Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-63312/4

Client Matrix:

Dilution:

Water 1.0

Date Analyzed:

09/09/2010 1746

Date Prepared:

Analysis Batch: 360-63312

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID:

Initial Weight/Volume: 1.0 mL

Final Weight/Volume:

1.0 mL

Qual Result % Rec. Limit Spike Amount Analyte 85 - 115 3.78 Nitrate as N 4.00 4.00 3.67 92 85 - 115 Nitrite as N

Client: Olin Corporation

Job Number: 360-30036-1

Method Blank - Batch: 360-63313

Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-63313/3 Client Matrix:

Water 1.0

Date Analyzed:

Dilution:

09/09/2010 1731

Date Prepared: N/A

Analysis Batch: 360-63313

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: 1.0 mL

Final Weight/Volume:

1.0 mL

Analyte Chloride

Result

ND

Qual

RL

RL 1.0

1.0

Lab Control Sample - Batch: 360-63313

Method: 300.0

Preparation: N/A

Lab Sample ID: LCS 360-63313/4

Client Matrix:

Water

Dilution:

1.0

Date Analyzed: 09/09/2010 1746

Analysis Batch: 360-63313

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume:

1.0 mL

Final Weight/Volume: 10 mL

Date Prepared: N/A

Analyte

Spike Amount

Result

% Rec.

Limit

Qual

Chloride

40.0

38.6

85 - 115

Client: Olin Corporation

Job Number: 360-30036-1

Method Blank - Batch: 360-63466

Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-63466/3

Analysis Batch: 360-63466

Instrument ID: No Equipment Assigned

Client Matrix:

Water

Prep Batch: N/A Units: mg/L

Lab File ID: N/A

1.0 mL

Dilution: Date Analyzed:

1.0

09/21/2010 1232

Date Prepared: N/A Initial Weight/Volume: Final Weight/Volume:

1.0 mL

Result ND ND

Qual

RL 2.0

1.0

RL 2.0 1.0

Chloride

Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-63466/4

09/21/2010 1247

Analysis Batch: 360-63466

Instrument ID: No Equipment Assigned

Client Matrix:

Water

Lab File ID: N/A

Qual

Dilution:

Lab Control Sample - Batch: 360-63466

Prep Batch: N/A

1.0 mL

1.0

Units: mg/L

Initial Weight/Volume:

Date Analyzed:

N/A

Final Weight/Volume: 10 mL

Date Prepared:

Analyte	Spike Amount	Result	% Rec.	Limit
Sulfate	80.0	80.4	100 //	85 - 115
Chloride	40.0	41.0	102	85 - 115

Job Number: 360-30036-1 Client: Olin Corporation

Method: L107-06-1B Method Blank - Batch: 360-63132

Preparation: Distill/Ammonia

Analysis Batch: 360-63430 Lab Sample ID: MB 360-63132/1-A Instrument ID: No Equipment Assigned

Lab File ID: N/A Water Prep Batch: 360-63132 Client Matrix:

Ammonia

Ammonia

Initial Weight/Volume: 50 mL Units: mg/L Dilution: 1.0 Final Weight/Volume: 50 mL

Date Analyzed: 09/21/2010 1439 09/14/2010 0930 Date Prepared:

RL RL Qual Analyte Result ND 0.10 0.10

Method: L107-06-1B Lab Control Sample - Batch: 360-63132

Preparation: Distill/Ammonia

Instrument ID: No Equipment Assigned Lab Sample ID: LCS 360-63132/2-A Analysis Batch: 360-63430

N/A Water Prep Batch: 360-63132 Lab File ID: Client Matrix: Units: mg/L Initial Weight/Volume: 50 mL

Dilution: 1.0 Date Analyzed: 09/21/2010 1440 Final Weight/Volume: 50 mL Date Prepared: 09/14/2010 0930

10.0

Spike Amount Result % Rec. Limit Qual Analyte 85 - 115

9.61

Client: Olin Corporation

Job Number: 360-30036-1

Method Blank - Batch: 360-63309

Method: SM 2510B Preparation: N/A

Lab Sample ID: MB 360-63309/4

Water

Client Matrix: 1.0

Dilution: 09/14/2010 1135 Date Analyzed:

Date Prepared: N/A Analysis Batch: 360-63309

Prep Batch: N/A

Units: umhos/cm

Instrument ID: Autotitrator 10091400.TXT Lab File ID:

Initial Weight/Volume:

Final Weight/Volume: 1.0 mL

Analyte

Specific Conductance

Result ND

Qual

RL

Method: SM 2510B

Preparation: N/A

RL

1.0 1.0

Lab Control Sample - Batch: 360-63309

Client Matrix:

Lab Sample ID: LCS 360-63309/1

Dilution:

Water 1.0

Date Analyzed: 09/14/2010 1114

Date Prepared: N/A

Analysis Batch: 360-63309

Prep Batch: N/A

Units: umhos/cm

Instrument ID: Autotitrator

Lab File ID:

10091400.TXT

Initial Weight/Volume:

Final Weight/Volume: 1.0 mL

% Rec. Limit Qual Result Spike Amount Analyte 85 - 115 1410 1390 Specific Conductance

State Accreditation Matrix

	T		State where Primary Accreditation is Carried				
		New Hampshire	State where P	Ilmary Accreditat	Florida	North	
Method Name	Description	(NELAC) prim.	Mass	Conn	(NELAC)	Carolina	
821-R-02-012	Toxicity, Acute (48-Hour)(list upon request)	NP			NP		
SM 4500 CI F	Chlorine, Residual		NP				
SM 9215E	Heterotrophic Plate Count (SimPlate)		Р				
SM 9222D	Coliforms, Fecal (Membrane Filter)		P/NP				
SM 9223	Coliforms, Total, and E.Coli (Colilert-P/A)		Р				
SM 9224	Coliforms, Total, and E.Coli (Enumeration)		Р				
1103.1	E.coli Enterococcus		ambient/				
Enterolert 200.8 Rev 5.4	Metals (ICP/MS) (list upon request)	NP/P	source NP/P	NP/P			
200.8 Rev 5.4 200.7 Rev 4.4	Metals (ICP/MS) (list upon request) Metals (ICP)(list upon request)	NP/P	NP/P	NP/P			
6010B	Metals (ICP)(list upon request)	NP/SW	INI /I	NP/SW			
245.1	Mercury (CVAA)	NP/P	NP	NP/P			
7470A	Mercury (CVAA)	NP		NP			
7471A	Mercury (CVAA)	SW		SW			
SM 2340B	Total Hardness (as CaCO3) by calculation	NP/P	NP	NP/P			
3005A	Preparation, Total Recoverable or Dissolved Metals	NP/P		NP/P			
3010A	Preparation, Total Metals	NP/P		NP/P			
3020A	Preparation, Total Metals	NP/P/SW		NP/P/SW			
3050B	Preparation, Metals	SW		SW			
504.1	EDB, DBCP and 1,2,3-TCP (GC)	Р	Р	Р			
608	Organochlorine Pest/PCBs (list upon request)	NP	NP	NP			
625	Semivolatile Org Comp (GC/MS)(list upon request)	NP		NP			
3546	Microwave Extraction	SW					
3510C	Liquid-Liquid Extraction (Separatory Funnel)	NP		NP			
3540C	Soxhlet Extraction	SW		0144			
3550B 600/4-81-045	Ultrasonic Extraction	SW	NP	SW NP			
8081A	Polychlorinated Biphenyls (PCBs) (GC)	NP/SW	NP	NP/SW			
8082A	Organochlorine Pesticides (GC)(list upon request) PCBs by Gas Chromatography(list upon request)	NP/SW		NP/SW			
8270C	Semivolatile Comp.(GC/MS)(list upon request)	NP/SW		NP/SW			
CT ETPH	Conn - Ext. Total petroleum Hydrocarbons (GC)	1117011		NP/SW			
MA-EPH	Mass - Extractable Petroleum Hydrocarbons (GC)			NP/SW		NP/SW	
524.2	Volatile Org Comp (GC/MS)(list upon request)	Р	Р	Р			
524.2	Trihalomethane compounds	Р	Р	Р			
624	Volatile Org Comp (GC/MS)(list upon request)	NP	NP	NP			
5035	Closed System Purge and Trap	SW		SW			
5030B	Purge and Trap	NP		NP			
8260B	Volatile Org Comp. (GC/MS)(list upon request)	NP/SW		NP/SW			
MAVPH	Mass - Volatile Petroleum Hydrocarbons (GC)			NP/SW		NP/SW	
180.1	Turbidity, Nephelometric	Р	Р	Р			
300	Anions, Ion Chromatography	NP/P	NP/P	NP/P			
410.4	COD	NP	NP	NP			
1010	Ignitability, Pensky-Martens Closed-Cup Method	SW	ND	SW			
10-107-06-2	Nitrogen, Total Kjeldahl	NP NP/SW	NP	NP NP/SW			
7196A	Chromium, Hexavalent Cyanide, Total and/or Amenable	NP/SW		NP/SW			
9012A 9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	NP NP		NP/SW		1	
9040B	pH	NP		NP			
9045C	pH	SW		SW		1	
L107041C	Nitrogen, Nitrate	NP	Р	NP/P		1	
L107-06-1B	Nitrogen Ammonia	NP	NP	NP/P		İ	
L204001A CN	Cyanide, Total	Р	NP/P	NP/P		1	
L210-001A	Phenolics, Total Recoverable	NP	NP	NP		Î	
SM 2320B	Alkalinity	NP/P	NP/P	NP/P			
SM 2510B	Conductivity, Specific Conductance	NP/P	NP/P	NP/P			
SM 2540C	Solids, Total Dissolved (TDS)	NP/P	NP/P	NP/P			
101405405	Solids, Total Suspended (TSS)	NP	NP	NP			
SM 2540D	Chromium, Hexavalent	NP	NE /2	NP			
SM 3500 CR D	1		NP/P	NP/P			
SM 3500 CR D SM 4500 H+ B	pH	NP/P					
SM 3500 CR D SM 4500 H+ B SM 4500 NO2 B	Nitrogen, Nitrite	NP	Р	NP/P			
SM 3500 CR D SM 4500 H+ B SM 4500 NO2 B SM 4500 P E	Nitrogen, Nitrite Phosphorus, Orthophosphate	NP NP/P	P NP	NP/P NP/P			
SM 3500 CR D SM 4500 H+ B SM 4500 NO2 B SM 4500 P E SM 4500 P E	Nitrogen, Nitrite Phosphorus, Orthophosphate Phosphorus, Total	NP NP/P NP	Р	NP/P NP/P NP			
SM 3500 CR D SM 4500 H+ B SM 4500 NO2 B SM 4500 P E	Nitrogen, Nitrite Phosphorus, Orthophosphate	NP NP/P	P NP	NP/P NP/P			

Not all organic compounds are accreditied under NELAC

For methods with multiple compounds all compounds may not meet NELAC criteria, listing should be obtained from the laboratory The lab carries additional accreditations with several states. This is the laboratories typical listing but is subject to change based on the laboratories current certification standing.

Login Sample Receipt Check List

Client: Olin Corporation Job Number: 360-30036-1

Login Number: 30036 List Source: TestAmerica Westfield

Creator: Beaumier, Janine E

List Number: 1

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	0.0C
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

TestAmerica Laboratories, Inc. Chain of Custody Form

Test/America

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